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Large firm dynamics on the Nordic-Baltic scene

Implications for innovation and growth

by

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PREFACE

Several of the authors of this report were jointly engaged in research on the Nordic scene from the mid-1980s to the mid-1990s. Then they pursued an idea to focus on the largest manufacturing firms as a micro based approach to analyze industrial development, innovation and growth in the small, open Nordic economies. A data base was established for the largest firms in Sweden, Finland and Norway, and the idea of focusing on the 30 largest manufacturing firms was captured and applied by researchers studying other small, open economies.

These analysis documented that the largest firms, and in particular those who were internationally oriented, held an important position in the economic dynamics on the Nordic scene. Even though the largest firms differed in structure and size between the Nordic countries, they played an important role for the economic development of all these countries. The Swedish firms were historically large and established as multinationals. However, also the largest firms operating in Finland, Norway and Denmark increased their international operations quite rapidly from the early 1980s. They increasingly emerged as multinationals and globally oriented firms as Swedish firms had done several years earlier.

Well into the first decade of the new millennium the research team met again to exchange views on globalization, which definitely had caught speed since the early 1990s, and on technological change which obviously had changed the way firms considered the location and modes of production. We were curious to investigate the impacts of these forces of change on the operations of large firms, and to continue our research as to how these changes affected innovation and economic growth in small, open economies.

We decided to make efforts to see if we could get funding for a joint project where we would update information on the largest firms in each of the countries for the period 1996-2006. The data on the 30 largest manufacturing firms of each country from the mid-1970s to the early 1990s was to be extended. In addition, we wanted to collect information on the 30 largest private sector firms. Later we also decided to collect information on the largest firms in Estonia to extend our perspective from the pure Nordic to the Nordic-Baltic scene.

NICe (Nordic Innovation Centre) kindly decided to support 50 per cent of the costs for the project “Globalization, Firm Dynamics and Innovation Systems – the role of multinationals”, which had been outlined by a research group consisting of Pontus Braunerhjelm (KTH), Per Heum (SNF), Pekka Ylä-Anttila (ETLA), Torben Pedersen (CBS) and Tarmo Kalvet (Praxis). The remaining costs have been covered through other project funding and from resources from the cooperating institutes.

The members of the research group have been responsible for collecting data on the largest firms in their respective countries. For different reasons the data collection was more challenging this time than 15-20 years ago. This is partly due to the fact that firms no longer seem to keep the same detailed information on their global activities at the head quarter level. Their operations are in general more decentralized. Thus, data collection required more resources than originally planned, in particular in Norway. This has been one factor that has delayed the completion of this project.

As for this report, each of the members of the research group has been responsible for conducting the analysis and to write the chapter of their respective country. When it comes to the content of chapters 7 and 8, it has been drafted, rewritten and commented on by all the members of the research group. They are in essence a joint product.

We are grateful to NICe for supporting the project.

We thank Anne Kristin Wilhelmsen who has done a great job in preparing manuscripts from many different sources for publication in one report.

December 15, 2010

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Chapter 1

Introduction

Background

Public policy discussions on innovation and economic growth frequently emphasize the role of entrepreneurship and small and medium-sized firms (SMEs). They are expected to be a major, if not *the* major source of economic dynamics.

Undoubtedly, new ventures and rapidly growing technology-based SMEs are important in the restructuring of the European and Nordic economies. However, as pointed out by Mayer and Ottaviano (2007), it is the large firms – actually only a small number of companies – that account for most of the international economic activity in all European countries. The size distribution of firms is extremely skewed, and inevitably the largest corporations are responsible for the bulk of foreign trade and foreign investment. Mayer and Ottaviano (2007) point out that large internationally operating firms are a kind of economic “superstars”. Compared to the average firm they generate higher value added, employ more skilled workers, pay higher wages, and often show higher labour productivity.

Already in 1993 we documented the importance of large, internationally oriented corporations in the economic dynamics on the Nordic scene (Heum and Ylä-Anttila, 1993). Industry structures differ across the Nordic countries, but they all feature internationally operating firms which significantly influence on economic development. These firms are among the largest in each country. There are, nevertheless, major differences in the firm structure between the Nordic countries. While the Swedish economy traditionally has been dominated by a handful of large corporations, the characteristic feature of the Danish economy has been a strong small and medium sized enterprise sector. The Finnish corporate structure is

becoming more similar to that of Sweden, and the Norwegian has been somewhere in between the Danish and the Swedish.

Globalization has gained momentum since the early 1990s, spurred by technology that has changed the way in which the location and modes of production are considered. The largest corporations also seem to have been the forerunners in off-shoring of production and in splitting the value chains into smaller and smaller slices, and moving them to more cost-efficient locations. The home country effects of these new types of international activities are not well known so far. It is of particular interest to investigate how these changes in the structure and operations of large, internationally oriented firms affect innovation and economic growth in small, open economies.

The answer to such questions, which concern the international competitiveness and performance of national economies, is determined at the micro level where the actual decisions on trade and location of production are made. Therefore, we apply firm-level data on large corporations to shed light on these mechanisms. These issues are not only of academic interest, they do also preoccupy policy makers in the Nordic countries.

Aims of the study

This report is essentially descriptive. We have chosen to focus on the 30 largest corporations in each of the Nordic countries, classified on either all industries or the manufacturing sector, to investigate their role in the economy. We pay special attention to their role as generators of value added and employment, and to how they contribute to national R&D expenditure.

In the descriptive study we are interested in how these roles of large firms have changed over time in the different Nordic countries, whether there are differences between the manufacturing sector and across all industries, and how the roles of the largest firms may differ between the Nordic countries. We know that national responses to European integration

have been somewhat dissimilar across the Nordic scene, but do we see any differences in corporate strategies and structures as a consequence of this?

In our study we have also included large corporations operating in Estonia. Estonia, along with the other Baltic states, is geographically placed in the close neighborhood of the Nordic region, and its economic activities have relatively recently become an integrated part of the European economy. Politically, efforts are made to extend the Nordic cooperation to the Nordic-Baltic scene. The question we address is to what extent the development of company structures in the emerging economy of Estonia differs from that in Denmark, Finland, Norway and Sweden.

Country context

Even though our focus is on the industrial operations at the micro level of the economy, the large firms which we study are based in countries which constitute different contexts for their operations. The country context for the companies of this study is illustrated in Table 1.1. All the largest companies in the Nordic countries are characterized by having their industrial base in a small country, with high value generation per capita, and economies that are open towards foreign trade. In all these countries expenditures on education are relatively high compared to EU-27, and, in addition, they all, with the exception of Norway, spend relatively much on R&D. Average labour costs are high in all countries. Nevertheless, economic growth rates in the first decade of the new century have, with the exception of Denmark, been above the EU-27 average. Denmark, however, is currently ranked in the top 3 of the global competitiveness index of World Economic Forum, and all the Nordic countries rank relatively high in such comparisons of economic competitiveness between countries.

Table 1.1: Key economic figures for the countries in question

	Sweden	Denmark	Finland	Norway	Estonia	EU-27
Population, 1000 people in 2008	9.182	5.475	5.300	4.737	1.340	497.649
GDP per capita, 2008 EURO, PPS	31.300	30.500	29.000	45.700	17.600	24.800
Exports and imports, % of GDP 2007	94,9%	102,3%	85,1%	76,4%	158,5%	28,9%
Expenditure on educational institutions 2005, % of GDP	6,4%	7,4%	5,9%	5,8%	5,0%	5,4%
R&D, % of GDP 2006	3,74%	2,48%	3,48%	1,52%	1,14%	1,85%
Average gross annual earning, full time employees in industry and services, EURO 2006	35.084	48.307	34.080	47.221	-	28.992
Average annual growth rate in GDP, 2000-2008	2,8%	1,5%	3,2%	2,4%	7,0%	1,8%
Rank position on World Economic Forum's Global competitiveness index, 2009-2010	9	3	6	17	26	n.a.

Source: Eurostat yearbook 2009, World Economic Forum

Estonia represents an even smaller, and also even more open economy, than the four Nordic countries of this study. It is not as rich as the Nordic countries, and cost levels are significantly lower. Other data than the ones presented in the table indicate that the cost level of labour is less than 20% in Estonia when compared to what it is in Sweden, Denmark, Finland and Norway. Expenditure on education and R&D is somewhat lower in relative terms, but growth rates have been much higher, and the country ranks high on the global competitiveness index.

Data

We employ a unique data base of large Nordic companies gathered nationally in each country. We have basically two datasets. The first one consists of the year-by-year listings of the 30 largest manufacturing firms measured by total employment. This dataset is equal to data used

in the former Nordic database (Braunerhjelm et al., 1996). We merge the previous data set and the one collected for this study.

The second dataset consists of the annual listings of the 30 largest firms across all industries, conditional to the fact that every year there have to be at least ten firms from other industries than manufacturing. This means that in this dataset there can, in fact, be more than 30 firms per year. A more detailed description of national data collection and possible specificities of the data are given in the beginning of each country chapter. The time horizon in the Estonian chapter is shorter, covering the period 2001-2006 as earlier periods are very difficult to track due to extreme changes following the initial efforts to transform the economy into a market based economy.

Structure of the report

In this report we present an overview of the role of large firms in the four Nordic countries and Estonia separately, before we summarize by making comparisons between the countries in terms of similarities and differences in the development of their large firms. The country studies are presented in an order which reflects the population size of the countries. We start with Sweden, and then Denmark, Finland, Norway and Estonia follow. The Estonian case is to some extent also about the large Nordic firms as their Estonian affiliates rank among the largest firms in Estonia. Finally, we discuss how the patterns of development among the large firms may affect the innovative environment on the Nordic-Baltic scene, and challenges that are created for policy formulation.

Chapter 2

Large corporations in the Swedish economy

Pontus Braunerhjelm and Torbjörn Halldin, KTH Royal Institute of Technology

Introduction

Background

In Sweden, large industrial corporations have traditionally played an important and significant role in the domestic economy. Through their activities, they have contributed to the economic growth of the 20th century. As large employers in the Swedish economy, their importance for stability and welfare cannot be underestimated. Much of the foundations of the Swedish welfare model rely on having large stable corporations as a source of employment opportunities and as generators of value added for the overall economy. Moreover, these large firms have also been an important source of tax income for the domestic economy.

Many of these large firms have managed to grow organically due to their successful R&D operations and continuous strive to develop new and innovative products. Most of the large corporations were founded on a number of original patents, which were exploited over the years. However, in recent years, internationalisation processes have become more accentuated everywhere around the globe. This has influenced the corporate lives of most firms, especially large industrial firms, which have been given opportunities to adopt offshoring strategies to low-wage countries. Already in the latter half of the 1980s Swedish firms became increasingly engaged in foreign direct investments activities (FDI), primarily through mergers and acquisitions. To some degree, this has led to a reshaping of the Swedish corporate landscape. Nowadays, we often tend to see production and headquarter functions separated in space. This structural shift has had consequences for the demand for labour in the large firms.

Hence, the role of the largest firms in the domestic economy has changed during the past decades. Nowadays, large firms in industrialized countries employ low-skilled workers to a much smaller degree in their domestic units, a fact that has prompted policy makers to carefully consider how globalisation influences the behaviour of large Swedish firms. However, expanding markets and an overall stronger competitive global position due to offshoring might well lead to an increase in domestic demand for labour with certain skills. Therefore the net effect of globalisation on Swedish employment remains an open question.

Aims of the study

This country chapter aims at presenting the role of the largest firms in the Swedish economy for the time period 1996-2006. By investigating how the role of the largest firms has developed over time, the objective is to reveal some key elements of the dynamics and transformation of large firms that can be traced to their increasing foreign activities and the ensuing implications for Swedish based industry. The focus will be on the structural change of large firms with regard to employment, sales and R&D activities, and the implication for the innovative environment in Sweden.

Data sources and construction of datasets

There are two parallel datasets constructed, both spanning the time period 1996-2006. The main dataset consists of annual listings of the 30 largest firms in all fields measured by total employment. In addition we also construct a separate dataset restricted to the 30 firms with the largest employment in the manufacturing sector. The reason for constructing this second dataset is to obtain longer time series by linking it to an earlier study (Braunerhjelm et al., 1996). This earlier study focused on manufacturing and mining firms and contained data for the years 1975-1990. It should be noted that having mining firms included among the 30 largest firms in this earlier time period only leads to minor differences compared to having

only manufacturing firms included. Keeping this in mind, we extend our dataset of manufacturing firms back to 1975.

The data on firm-level characteristics of large Swedish corporations are mainly from *Sveriges största företag*, which is an annually recurring volume of financial data and rankings of Sweden's largest corporations. These data are based on annual fiscal reports and include the following variables: number of employees in Sweden and abroad, sales, foreign sales, profits and total assets. Due to the absence of available data on the division of R&D into domestic and foreign activities, data from ITPS¹ on large multinational corporations are used to describe the international expansion of R&D activities in large Swedish firms during the period 1995-2005. Two additional variables, research and development expenses and data on value added², were collected manually from annual reports found mainly on the web sites of the respective firms. For some firms the reports had to be ordered in paper format and for those firms that no longer exist due to mergers and acquisitions or other reasons, annual reports from the library collection at the Royal library in Stockholm were used. Furthermore, aggregated industry data from Statistics Sweden were used in order to relate the developments of the 30 largest firms in each dataset to the overall progress of Swedish firms.

Descriptive analysis

Stability in rankings

The Swedish economy has long been characterised by a few large and dominant firms, perhaps more than any other country. Thus, the ongoing globalization may have a particularly distinct impact on the Swedish economy, simply because these firms have constituted a substantial part of the economy. A disentanglement from their domestic base could be

¹ ITPS is short for Institutet för tillväxtpolitiska studier (Swedish institute for growth policy studies).

² Value added is approximated as the total of personnel costs, which include remunerations and social costs, and corporate profits.

expected to have repercussions on several aspects of the Swedish industry unless new firms emerge that substitute for a conceivable relocation of the large firms activities.

Figure 2.1 depicts how the firms are distributed in terms of occurrences in the two datasets of the largest firms in 1996 to 2006. It is notable that in both datasets we observe around 50 firms being among the 30 largest at least once during the studied time period. Out of these, 15 firms in the dataset without sector restrictions and 16 firms in the manufacturing dataset remain throughout the whole period. We should also mention that a relatively large number of firms appear only a few times in the datasets, especially manufacturing firms.

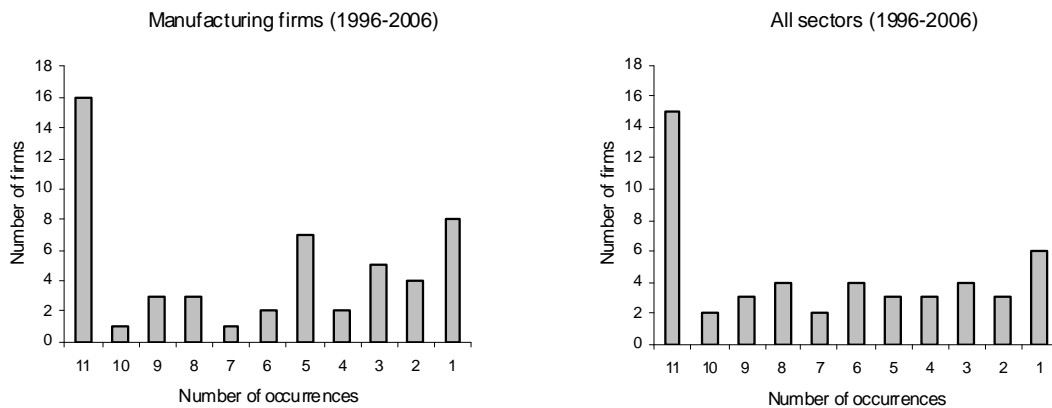


Figure 2.1: Distribution of firms in terms of occurrences among the 30 largest firms

In order to study the stability of the composition of firms appearing in the datasets we perform stability analysis on the basis of Spearman rank correlation coefficients. To calculate these correlation coefficients, all firms not qualifying for the top 30 in a certain year are ranked as 31. The rank correlations shown in the left-hand charts of Figure 2.1 refer to the year 1996 and subsequent years while the right-hand charts indicate correlations for the more recent time period with the year 2000 as base year. Ranking is based on total employment.

The correlations quite soon become weak which indicates that the group of companies is subject to change. This is somewhat more accentuated in the manufacturing sample, and it is clear from the figure that most of the change in the composition of firms took place in the late

1990s. One of the reasons for this might be the fact that we saw a number of mergers and acquisitions towards the end of the millennium. Examples are Astra that became AstraZeneca and Stora Kopparbergs that turned into StoraEnso. Another example of changes in the dataset that reduce the stability of its composition is Volvo Personvagnar that was acquired by Ford. This resulted in two companies appearing among the 30 largest instead of one as previously. Clearly, such changes affect the ranking of firms in the dataset.

To further investigate the stability of rankings of the firms in the two datasets, we plot the average change in rankings against the average rank for the firms in the respective sample. This is shown in the left scatter plots of Figure 2.3. If one considers the 30 firms that on average had the highest rank, one can see that the larger firms tend to be more stable in their rankings than the smaller ones. The right hand side of Figure 2.3 illustrates this relationship. It is also noteworthy to mention that it is the firms that were among the 30 largest throughout the time period that, with few exceptions, are the ones with lowest average change in rank.

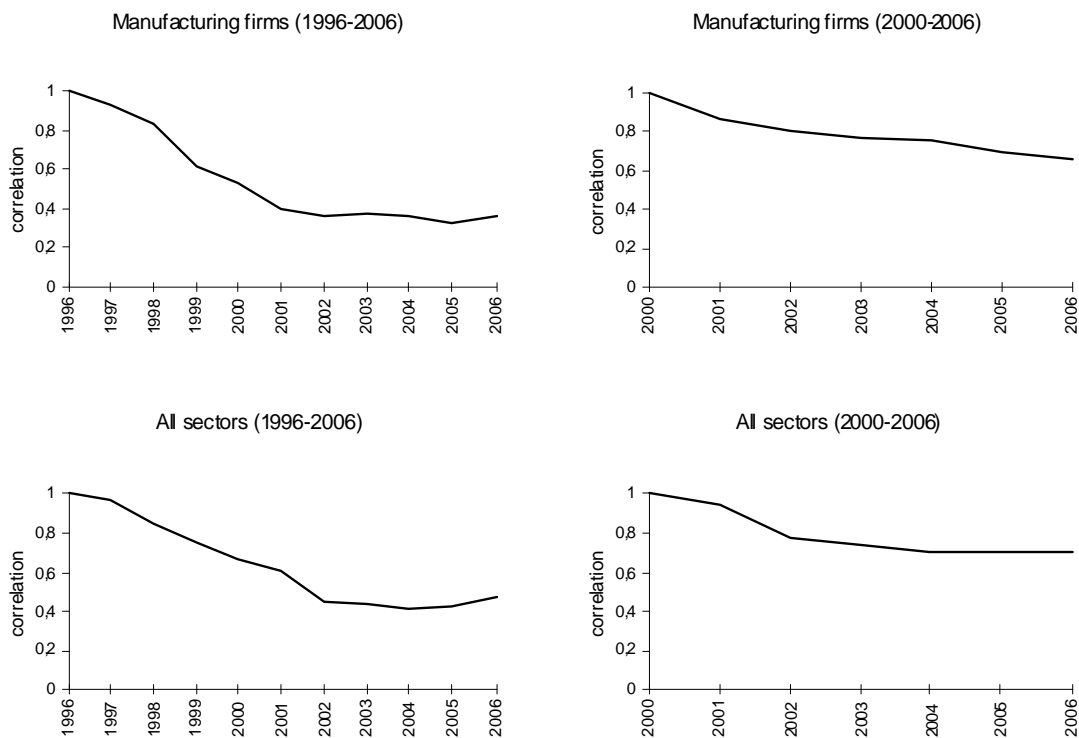


Figure 2.2: Rank stabilities for the firms in the dataset. Spearman rank correlation coefficients

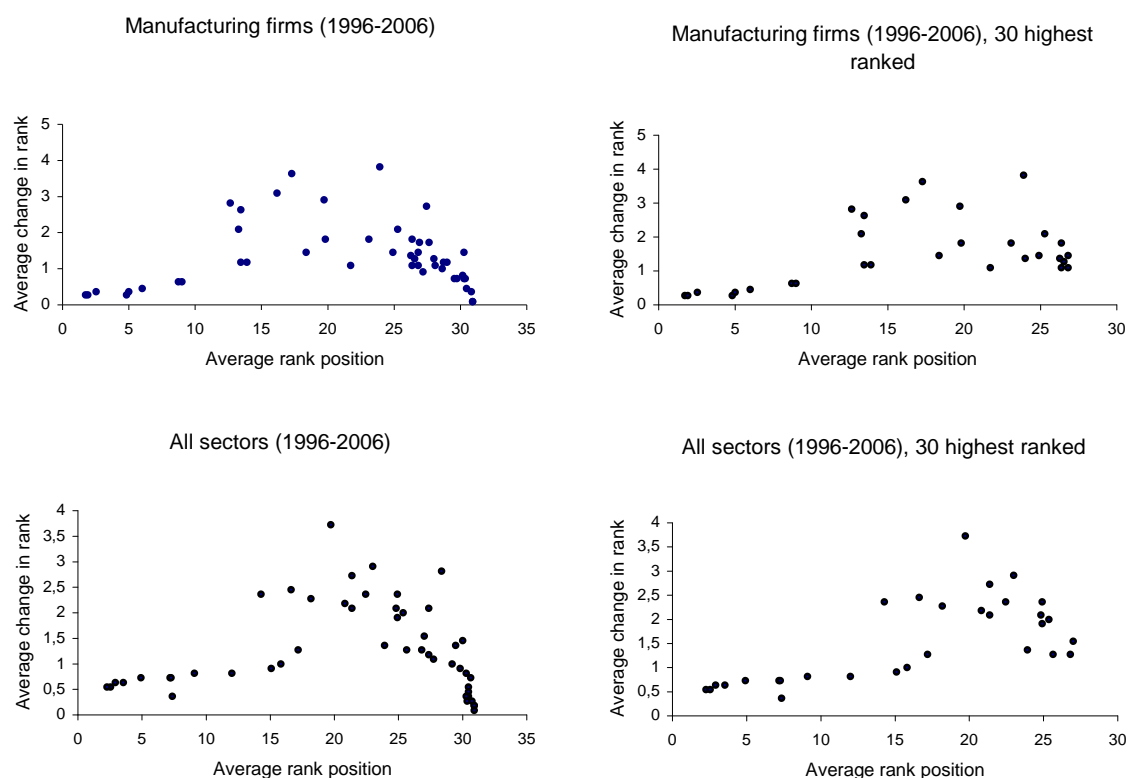


Figure 2.3: Stability in rank position vs. company size. The left panels are for all firms ever appearing in the datasets and the right panels are for the 30 with highest average rank

The role of the 30 largest firms in the Swedish economy

In order to compare the characteristics and developments of our two datasets over time, Table 2.1 depicts some key elements of the different data sets.³ First, it seems like the firms in the manufacturing sample are slightly more productive than the firms from the dataset including all sectors. The largest manufacturing firms also have a higher R&D to sales ratio. This is expected since many service sector firms without any R&D activities at all were included in the dataset without industry restrictions.

³ Aggregate data for 1996 were not available and, therefore, data for 1997 and not 1996 are used to describe the beginning of the studied time period.

Production

The table also depicts changes in the overall domestic industry between the years 1997 and 2006. Unfortunately, only domestic activities were available on an aggregate level, which makes the direct comparison to our two panels impossible. However, we note that, when it comes to labour productivity, defined as value added per employee, a tendency to an upward trend can be observed over the years both in our datasets and in the overall Swedish economy. Similarly, manufacturing firms have a higher average labour productivity and R&D intensity than the whole business sector sample. One should also note the large increase in the average amount of assets among the 30 largest firms in the all sector sample. This is mainly due to later years' inclusion of more financial sector companies in the dataset.

Industry composition and large firm growth

The industry distribution in terms of the share of firms belonging to a particular industry differs somewhat when comparing our two datasets to the overall industry distribution in the economy as a whole. Among the 30 largest manufacturing firms mechanical engineering is overrepresented as compared to the composition of the overall Swedish manufacturing industry. Mechanical engineering is also a large industry among the top 30 firms without industry restrictions: about 30 per cent belong to this industry while for Sweden in total this sector only accounts for three per cent of all firms. One should also note the relative importance of the manufacturing sector for the 30 largest firms. Out of the 30 largest firms in the dataset containing all sectors, more than 50 per cent belong to the manufacturing sector. This should be contrasted with the relative size of the manufacturing sector in Sweden as a whole, which amounts to less than ten per cent. Trade (retail and wholesale), and other services, have much fewer representatives among the 30 largest firms compared to these sectors' shares in the overall economy.

Table 2.1: Some firm-level characteristics in 1997 and 2006

	Largest 30 firms, global activities		Industry total, domestic activities	
	2006	1997	2006	1997
Panel A. Manufacturing firms				
Employment (average)	22245	22441	11	14
Net sales (average, msek)	43916	39331	25	27
Total assets (average, msek)	45745	41750	53	28
Value added/empl. (average, 1000 sek)	590	546	703	578
R&D/Net sales (average)	5,5%	5,1%	4,6%	4,2%
Industry (shares)				
Foods, textiles, apparel (15-19)	0,10	0,10	0,12	0,13
Pulp and paper (20-21)	0,03	0,13	0,12	0,12
Chemicals (23-25)	0,07	0,13	0,04	0,05
Mech. Engineering (27-29, 34-35)	0,57	0,53	0,33	0,33
Electr. Engineering (30-33)	0,17	0,10	0,08	0,09
Other manufacturing (22, 26, 36-37)	0,07	0,00	0,30	0,29
Panel B. All sectors				
Employment (average)	37447	29271	4	4
Net sales (average, msek)	58311	45935	6	5
Total assets (average, msek)	247265	74310	17	7
Value added/empl. (average, 1000 sek)	538	524	408	392
R&D/Net sales (average)	3,2%	4,3%	1,3%	1,3%
Industry (shares)				
Foods, textiles, apparel (15-19)	0,07	0,00	0,01	0,01
Pulp and paper (20-21)	0,03	0,10	0,01	0,01
Chemicals (23-25)	0,03	0,10	0,00	0,00
Mech. Engineering (27-29, 34-35)	0,33	0,27	0,03	0,03
Electr. Engineering (30-33)	0,07	0,10	0,01	0,01
Other manufacturing (22, 26, 36-37)	0,00	0,00	0,03	0,03
Electricity (40)	0,03	0,00	0,00	0,00
Construction (45)	0,03	0,07	0,10	0,11
Trade (50-52)	0,07	0,10	0,19	0,25
Transport (60-63)	0,03	0,10	0,05	0,07
Post and telecommunications (64)	0,07	0,07	0,00	0,00
Financial services (65-67)	0,10	0,03	0,01	0,01
Real estate (70)	0,03	0,00	0,07	0,06
Other services	0,07	0,03	0,49	0,38
Conglomerate	0,03	0,03	0,00	0,00

NOTES: Net sales, total assets and value added/employee have been deflated by GDP deflator (2000=100). NACE Rev. 1.1 industry codes are in the parentheses. NB! The financial data for the 30 largest firms and for the industry totals are not comparable since the values for the 30 largest firms represent global activities whereas the industry totals only incorporate domestic activities.

The growth rates of sales and employment are shown in Table 2.2. Since only a subset of firms remained in the datasets throughout the studied time period we restrict the calculations of growth rates to those firms. They constitute the core of the respective dataset, both in terms of employment and sales. We clearly see that the sample containing all sectors seems to have experienced a more rapid average growth rate than manufacturing firms. This is to a large extent due to the expansion of the service sector.

To further investigate these growth rates, the time period was divided into two sub-periods, 1996-2000 and 2000-2006. For sales, we see much higher annual growth rates in the late 1990's compared to the beginning of the new millennium. For the 16 firms in the manufacturing sample there was practically no growth in employment during the whole period. On the contrary, among the 15 firms from the all-sector sample, we see a positive growth in employment for the entire period. This growth is completely due to the employment expansion in the earlier sub-period.

Table 2.2: Growth of sales and employment for the firms remaining in the datasets throughout the period 1996-2006

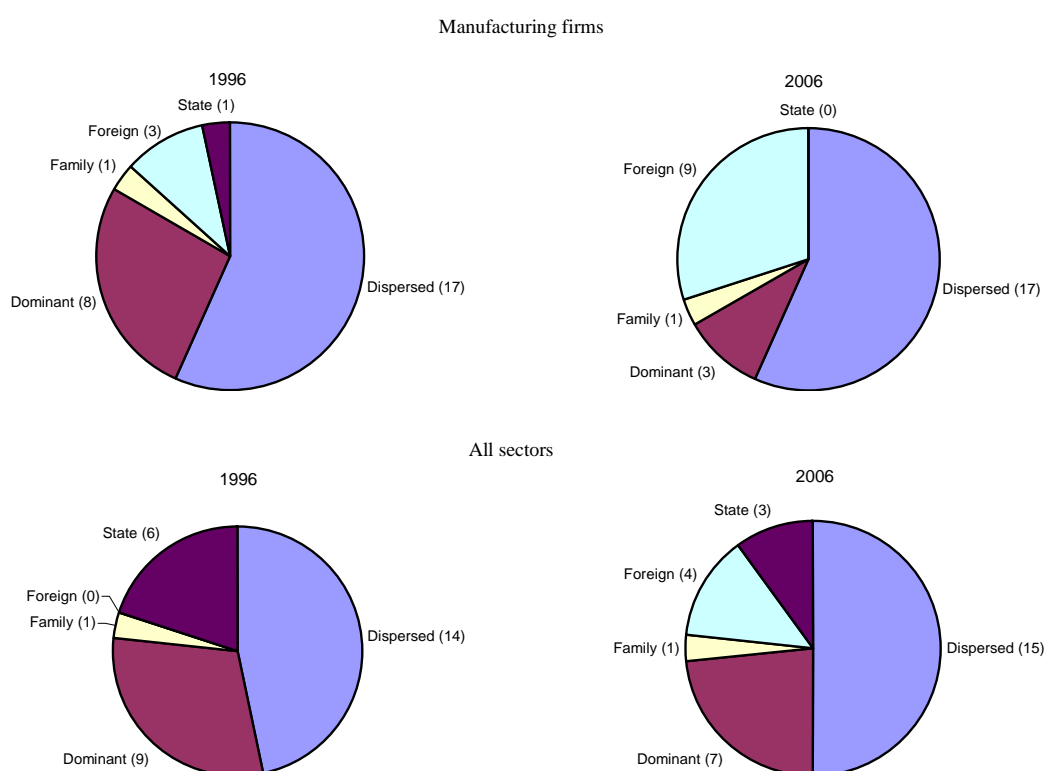
<u>Panel A. Manufacturing firms</u>		<u>Panel B. All sectors</u>	
Growth in sales, % p.a.		Growth in sales, % p.a.	
1996-2006	1,5	1996-2006	2,6
1996-2000	3,7	1996-2000	6,3
2000-2006	0	2000-2006	0,3
Growth in total employment, % p.a.		Growth in total employment, % p.a.	
1996-2006	0,2	1996-2006	2,4
1996-2000	-0,7	1996-2000	6
2000-2006	0,8	2000-2006	0

NOTES: There were 16 of the manufacturing firms and 15 of the all-sector firms that remained among the 30 largest for the whole time period. Growth rates in sales are based on deflated sales figures using the GDP deflator (2000=100).

Age and ownership

The 30 largest firms in the two datasets are, on average, much older than other firms. The ages of the firms included in the datasets for the year 2006 were on average 85 years for the sample including all sectors and 78 years for the manufacturing firms. The medians for the samples were 79 and 80 years respectively.

Figure 2.4 illustrates the distribution of ownership types for the largest 30 firms in 1996 and 2006. The ownership types have been categorised into five types according to how much of the capital that is owned by the largest owner. Dispersed ownership is defined as less than 20 per cent, dominant as 20-50 per cent and foreign, state and family when the major owner possesses more than 50 per cent of the capital. From the figure we can see that the foreign ownership has increased in both samples, from zero to four firms in the dataset without industry restrictions and from three to nine of the 30 largest manufacturing firms. One should also note that the state dominates fewer firms in 2006 compared to 1996 in both samples. When extending the time frame to include the years 1975, 1980, 1985 and 1990 from the earlier dataset in Braunerhjelm et al., we see that it is not until 1990 that foreign owned firms appear among the 30 largest. Hence, foreign ownership in large Swedish corporations must be seen as a rather recent phenomenon of the 1990's and 2000's.



NOTES: Data sources are the annually recurring volume *Ägarna och makten*, firms' annual reports and authors' estimates.

Figure 2.4: The distribution of ownership types among the 30 largest firms in 1996 and 2006

Productivity

The relationship between internationalisation and labour productivity is shown in Figure 2.5. These scatter diagrams depict the degree of internationalisation as the share of foreign sales to total sales on the horizontal axis and labour productivity as value added per employee deflated in 2000 prices on the vertical axis. The two samples have been divided into two sub-periods each, 1996-2000 and 2001-2006. We have included a trend line to illustrate the small positive relationship between the degree of internationalisation and labour productivity. The straight-line equations of the trend lines are also shown in the figure.

For the manufacturing sample the trend line is steeper for the sub-period 2001-2006 compared to the earlier sub-period 1996-2000. In the sample without industry restrictions on the contrary, we see the opposite result with a higher correlation in the earlier period. However, the spread in both datasets is quite large. Hence, the correlations should be investigated more carefully taking causal effects into account before concluding on a positive effect of internationalisation on productivity.

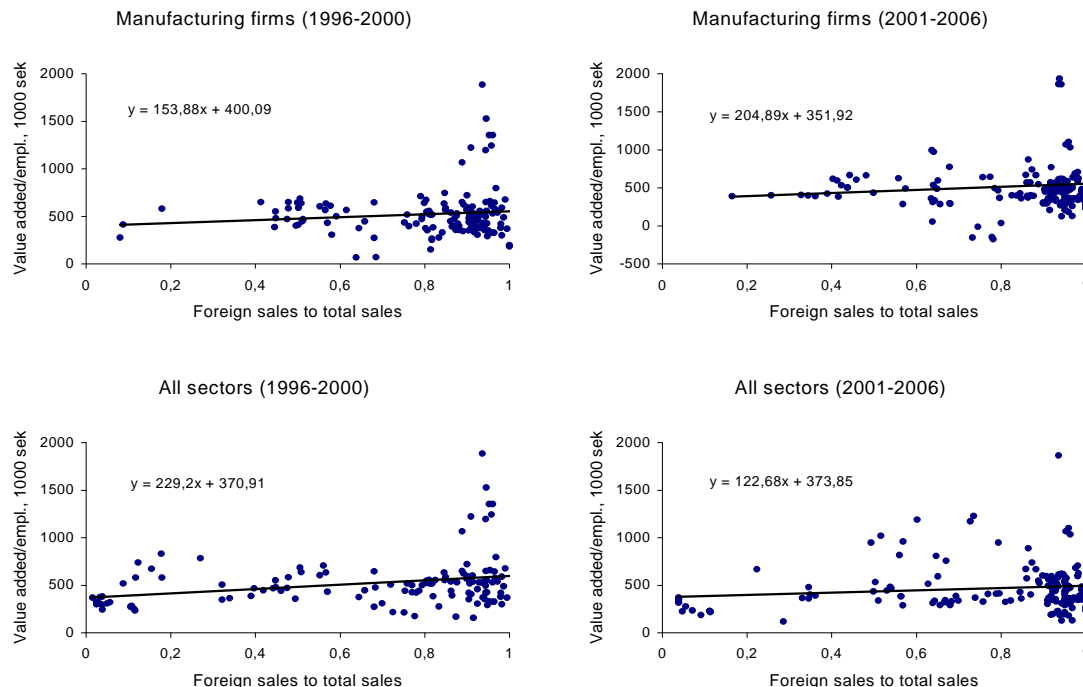
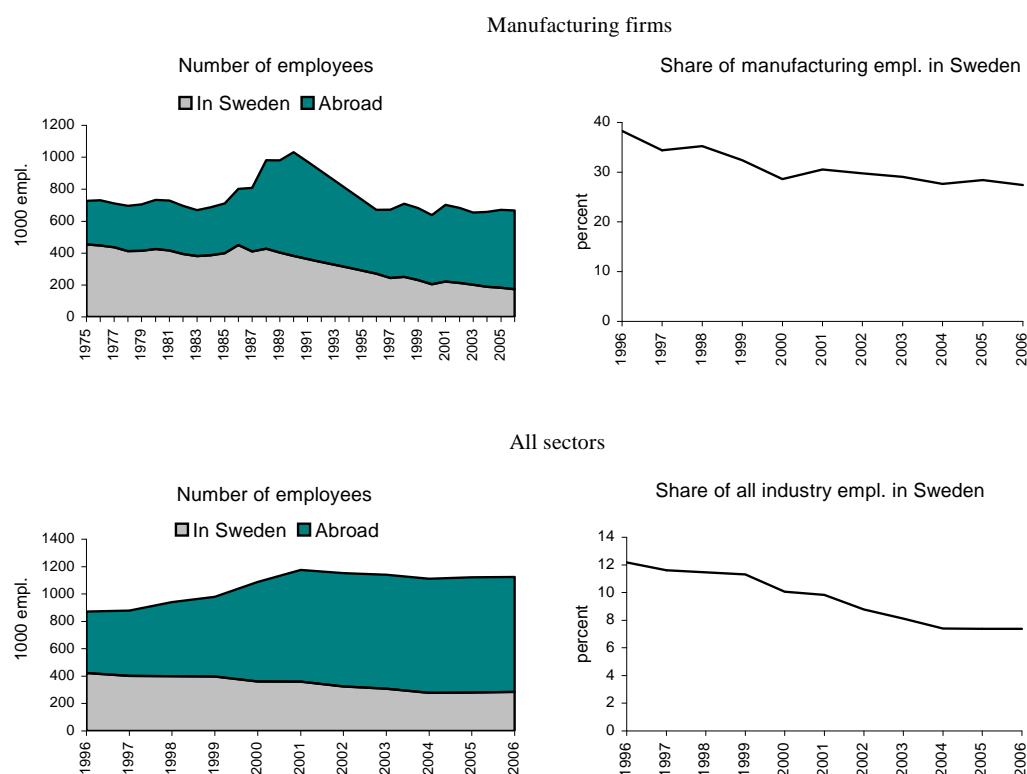


Figure 2.5: Degree of internationalisation and labour productivity

Internationalization: Employees, sales and productivity

In Figure 2.6 we can follow the development of employment in the 30 largest firms. The manufacturing sample has been linked to an earlier study (Braunerhjelm et al., 1996), and thereby extended to include data from 1975 to 2006. Braunerhjelm et al. (1996) included data for the time period 1975-1990. For the years between 1990 and 1996 data for manufacturing firms were interpolated. The all-sector sample contains data for the years 1996-2006. Whereas total employment in the largest firms has grown from 1996 to 2006 for the all-industry sample and stayed rather constant for manufacturing firms, the domestic part has shrunk by 33 and 36 per cent in the respective datasets. When considering the longer time period from 1975 for manufacturing firms the pattern becomes even clearer. The increasing share of total employment taking place abroad indicates the importance of the internationalisation process that currently is experienced within firms. Hence, Swedish multinationals now play a smaller role as employers in Sweden compared to earlier periods.

The right-hand charts in Figure 2.6 also indicate that the largest firms have reduced their role as domestic employers. The share of all corporate employment, taking place within the 30 largest firms, had fallen from 12 per cent in 1996 down to seven per cent in 2006. An equivalent reduction is seen for the manufacturing sector where the 30 largest manufacturing firms in 2006 employed 27 per cent of all manufacturing employment in Sweden compared to 38 per cent in the beginning of the studied time period.

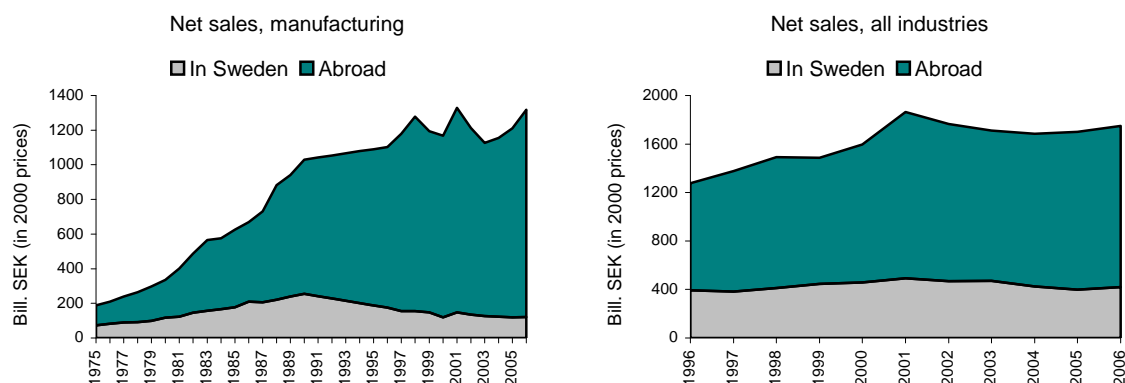


NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports, authors' estimates and Statistics Sweden. In the upper-left chart, the dataset for manufacturing firms has been extended back to 1975 using data from Braunerhjelm et al. (1996). It should furthermore be noted that data for 1975-1990 include mining firms as well as manufacturing firms. For the missing observations in the years 1991-1995 data have been interpolated.

Figure 2.6: Development of employment in the 30 largest firms and their share of total domestic employment

Figure 2.7 illustrates the development of domestic and foreign sales in the 30 largest firms. Again, the manufacturing sample has been linked to the earlier study of Braunerhjelm et al. (1996). The trend in sales is very similar to what is seen in employment, with an increasing share of activity taking place abroad. Total sales peaked in 2001 with 2.000 billion SEK (in 2000 prices) for the all-sector sample and 1.500 billion SEK (in 2000 prices) for manufacturing firms. For the sample including all sectors, domestic sales have been fairly constant over the time period 1996-2006, amounting to 380-500 billion SEK (in 2000 prices). However, during the same period we see a fairly stable reduction in domestic sales for manufacturing firms from 170 to 120 billion SEK (in 2000 prices). As can be seen from the chart, the share of foreign sales in total sales has increased, from 69 per cent in 1996 to 76 per

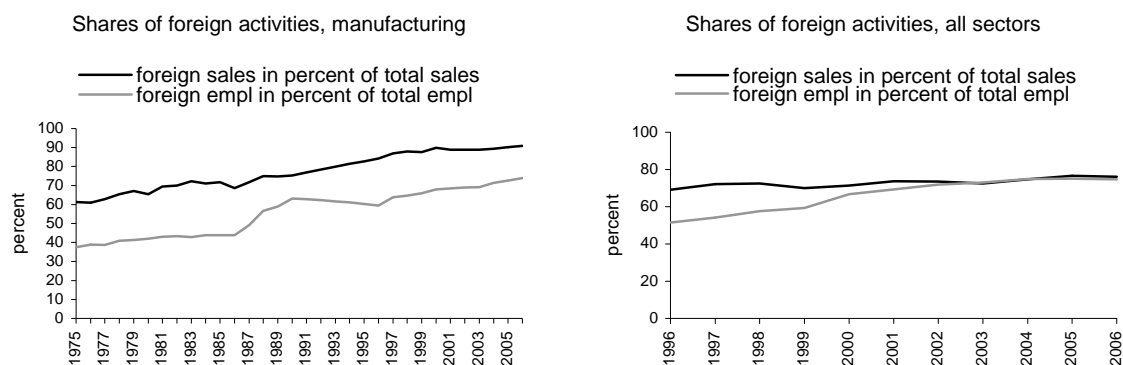
cent in 2006 for the sample without industry restrictions and from 84 to 91 per cent for manufacturing firms. When looking at the extended dataset for manufacturing firms, the increase in foreign sales becomes even more accentuated. In 1975 only 61 per cent of total sales were in terms of foreign sales. Thus, we see that not only production operations increase abroad but also sales, which enforces the importance of internationalisation.



NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports and authors' estimates. Domestic and foreign sales have been deflated by GDP deflator (2000=100). For manufacturing firms, the dataset has been extended back to 1975 using data from Braunerhjelm et al. (1996). It should furthermore be noted that data for 1975-1990 include mining firms as well as manufacturing firms. For the missing observations in the years 1991-1995 data have been interpolated.

Figure 2.7: Development of net sales for the 30 largest firms

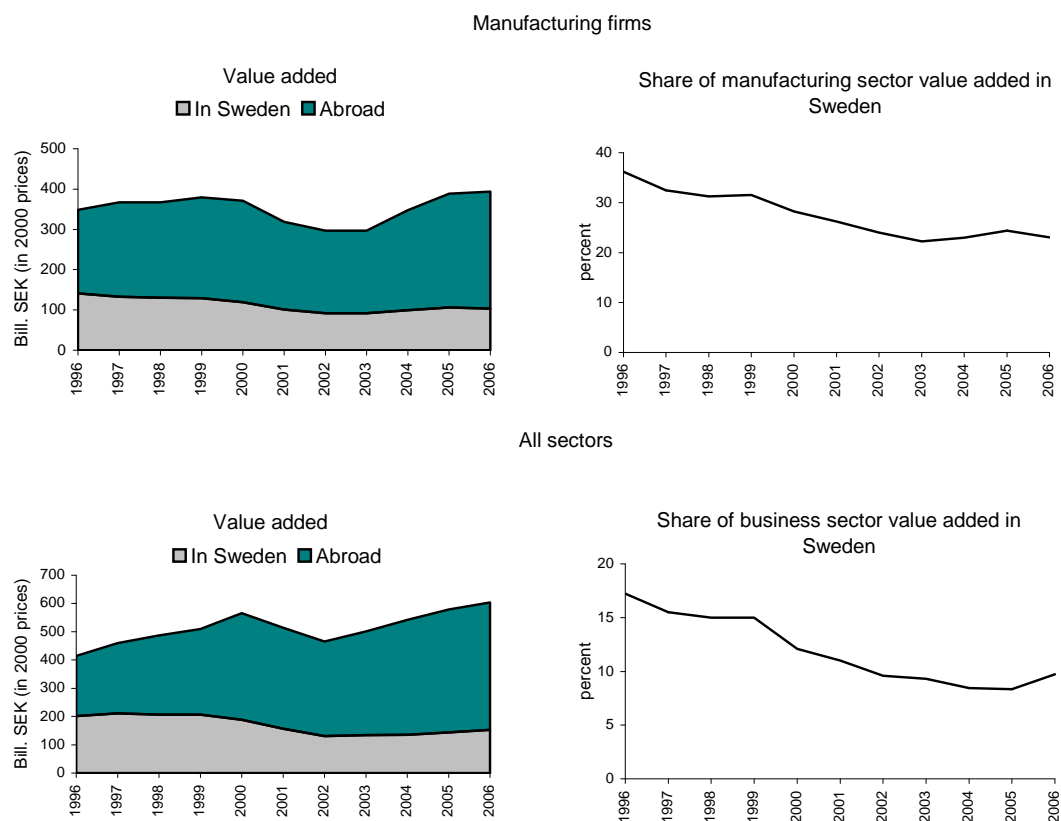
In order to obtain an indication of how much of the supply for foreign markets that is supplied from abroad and how much that is supplied through exports, Figure 2.8 depicts the developments of foreign sales and foreign employment in relation to total figures. We see that for manufacturing firms, for which the dataset has been extended back to 1975, there seems to be a rather constant gap between the two shares. This gap implies that the remaining part is supplied through exports from Sweden. For the all-sector sample this gap is narrower and towards the end of the studied time period it even vanishes. Hence, compared to manufacturing firms, less of the foreign sales in this sample are generated by exports directly from Sweden. This is a consequence of having service sector companies included in the sample. Since the gap between the two shares becomes smaller and smaller over time in the right-hand chart, we see this as a token of an increased importance of service-sector firms in the sample without industry restrictions.



NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports and authors' estimates. For manufacturing firms, the dataset has been extended back to 1975 using data from Braunerhjelm et al. (1996). It should furthermore be noted that data for 1975-1990 include mining firms as well as manufacturing firms. For the missing observations in the years 1991-1995 data have been interpolated.

Figure 2.8: Importance of foreign activities for sales and employment

From Figure 2.9 it can be seen that the foreign component of value added for the 30 largest firms has gained in importance. Except for the years 2001-2002, there has been a positive growth in value added. For the whole period, we see a growth of 46 per cent in the sample including all sectors and 13 per cent in the manufacturing sample. The right-hand charts depict the largest firms' share of total value added. This share has decreased significantly in both samples, from 20 to 11 per cent in the all-industry sample and from 41 to 26 per cent among manufacturing firms. Value added is measured as operating profits plus personnel costs, i.e. we have implemented a proxy that should however be quite close to value-added measured from the production side. In order to divide value added on foreign and domestic activities employment shares have been used, thus Figure 2.9 must be cautiously interpreted.



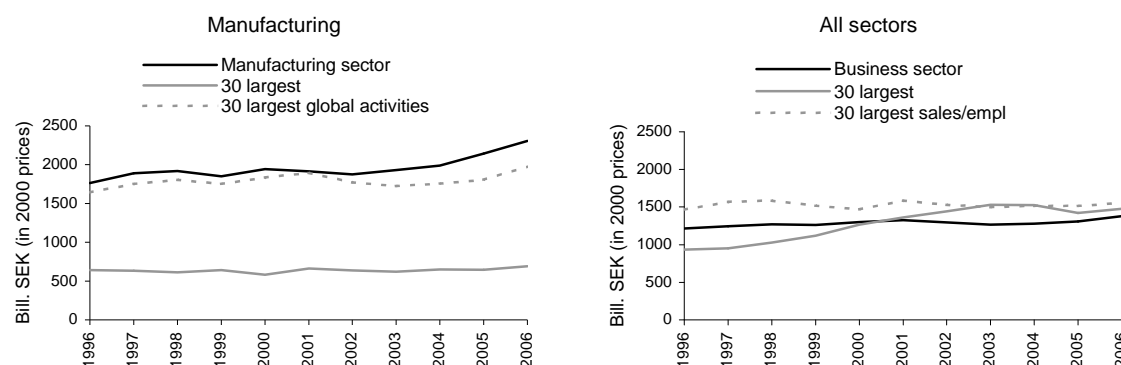
NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports, authors' estimates and Statistics Sweden. Value added is approximated by the sum of profits and personnel costs and it has been divided into domestic and foreign shares by the respective employment share. Value added has been deflated by GDP deflator (2000=100).

Figure 2.9: Development of value added for the 30 largest firms and their share of total value added

For our two panels, labour productivity in terms of value added per employee cannot be directly compared to the overall labour productivity in Sweden.⁴ Therefore, we construct another productivity measure, namely domestic sales per domestic employee. Figure 2.10 shows the development of this productivity measure for our two panels and their corresponding sector segment in Sweden. Much of R&D and headquarter operations are still located in Sweden and the bulk of sales take place abroad for large manufacturing firms, which is the reason why we have lower figures for the largest manufacturing firms compared to the overall manufacturing sector. For the sample without industry restrictions we tend to obtain similar productivity figures as for the whole business sector. Compared to the

⁴ See from the discussion about Table 2.1 above why it is not possible to conduct such a direct comparison.

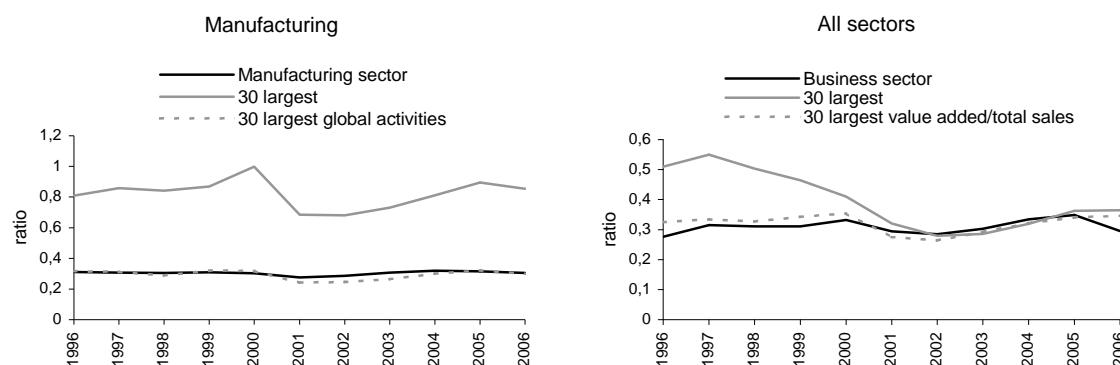
manufacturing sample of large firms, the all-sector sample contains many service companies with most of their sales within the Swedish borders. Such companies are for example Posten (the Swedish postal service), SAS and financial banks.



NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports, authors' estimates and Statistics Sweden. Domestic sales have been deflated by GDP deflator (2000=100).

Figure 2.10: Sales per employee as productivity measure. Solid lines represent domestic sales per domestic employee and dotted lines indicate global activities

Figure 2.11 depicts a measurement of specialisation where a high ratio of domestic value added to domestic sales is interpreted as a low degree of specialisation, due to increased vertical specialization. As can be seen from Figure 2.11, there seems to be very little difference between the large firms' overall share as compared to the total industry, whereas a different pattern emerges if only the domestic share of the large firms are considered. However, since exports are not incorporated in these figures, one should not place too much emphasis on what they indicate. Rather, the conclusion is that irrespective of which measure that is used, it is hard to find a pattern of stronger specialization defined in this way.

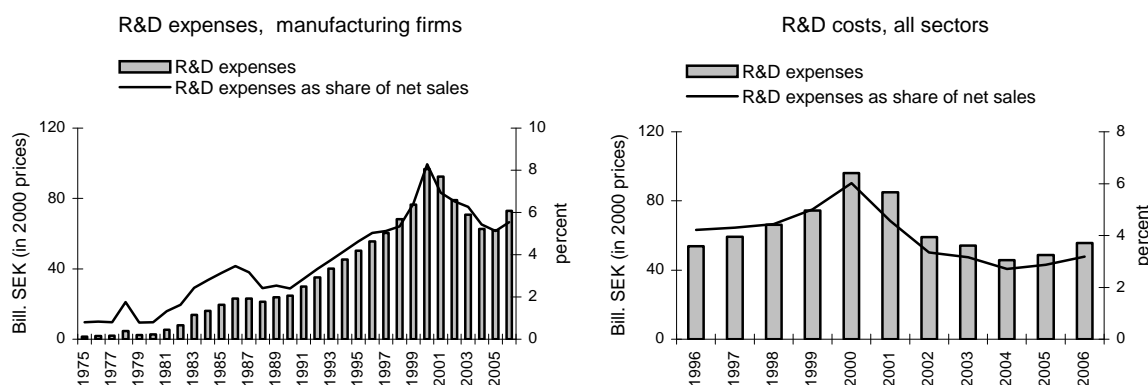


NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports, authors' estimates and Statistics Sweden. Value added is approximated by the sum of profits and personnel costs and, for the two datasets, it has been divided into domestic and foreign shares by the respective employment share.

Figure 2.11: Developments of the ratio between value added and sales. Solid lines represent domestic value added over domestic sales and dotted lines indicate global activities

Internationalization: R&D

Figure 2.12 shows the development of R&D costs for the 30 largest firms. The manufacturing sample has been linked to the earlier dataset in Braunerhjelm et al. (1996). Even though we have some missing observations on R&D expenses in this earlier dataset, the upward trend over the past three decades is clear, both in terms of R&D expenses and R&D intensity. The R&D expenditure for the 30 largest firms had its peak in the beginning of the millennium with more than 100 billion SEK. In 2000, its share of net sales reached 6 per cent for the sample including all industries and 8 per cent for the manufacturing sample. However, one should note that total R&D expenditures in Sweden are to a large extent mirrored by the actions taken by Ericsson, which went through a financial crisis in the years following the IT-boom in 2000-2001. The effects of these difficult years on the 30 largest firms in both samples can be seen in the reduction of profits by around 80 per cent between 2000 and 2002. The developments of the profits to sales and profits to total assets ratios for the firms in the two datasets are shown later in Figure 2.15.

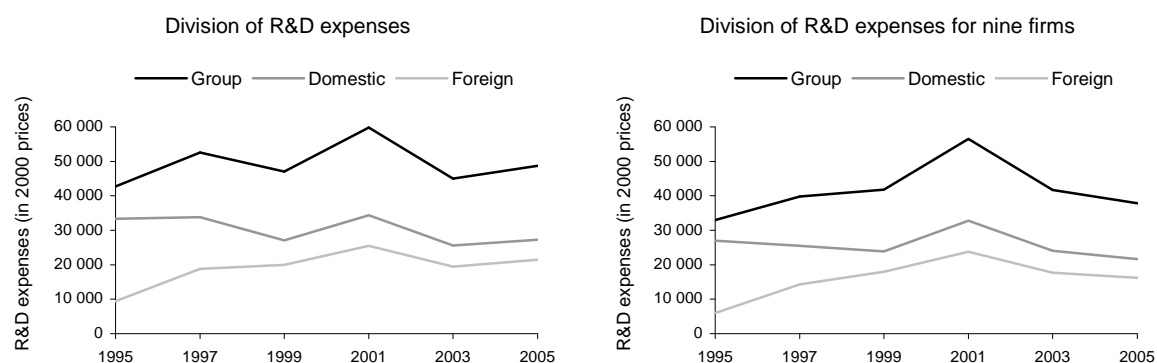


NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports and authors' estimates. R&D expenses have been deflated by GDP deflator (2000=100). For manufacturing firms, the dataset has been extended back to 1975 using data from Braunerhjelm et al. (1996). It should be noted that data for 1975-1990 include mining firms as well as manufacturing firms. Due to some missing observations on R&D expenses in the earlier dataset, one should be careful when interpreting the whole time series. For the missing observations in the years 1991-1995 data have been interpolated.

Figure 2.12: Development of R&D costs for the 30 largest firms in total and as share of net sales

Due to the absence of data on how R&D is divided between foreign and domestic activities for the 30 largest firms in our two datasets, we instead present data on international R&D activities collected by ITPS for the years 1995-2005.⁵ This is done in order to obtain a picture of how the internationalisation of R&D activities has evolved during our studied time period. The left-hand chart of Figure 2.13 shows the development of all firms included in the ITPS database, whereas the right-hand chart depicts the development of the nine firms remaining in the dataset throughout the studied time period. From the figure it can be seen that the foreign component of R&D has grown and almost caught up with its domestic counterpart. Still, however, large Swedish multinational firms invest more in domestic than in foreign R&D activities.

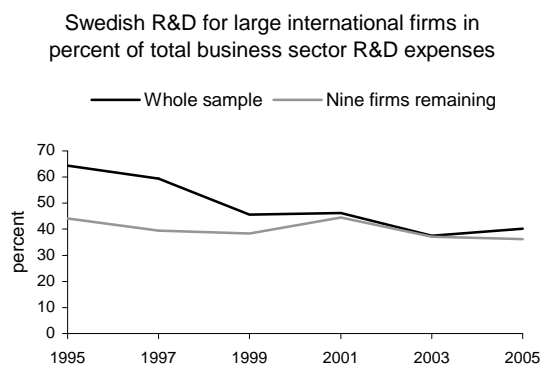
⁵ The ITPS database consists of the around 20 firms with the largest foreign employment each year. Hence, like in our two datasets, the identity of the firms may vary over the years.



NOTES: The data source is an ITPS survey on R&D activities for the largest Swedish corporations ranked by foreign employment. R&D expenses have been deflated by GDP deflator (2000=100).

Figure 2.13: Division of R&D expenditures on foreign and domestic activities

One can also investigate what role large Swedish multinational firms play in overall domestic R&D expenses. Figure 2.14 clearly shows that a large part of Swedish R&D expenditure takes place in a small number of large firms. As much as about 40 per cent of all domestic R&D takes place within only nine large international firms. This figure seems to be rather constant over time.



NOTES: The data sources are an ITPS survey on R&D activities for the largest Swedish corporations ranked by foreign employment and Statistics Sweden. R&D expenses have been deflated by GDP deflator (2000=100).

Figure 2.14: Importance of large international firms in total domestic R&D

Two types of profitability measures are shown in Figure 2.15, profits to sales and profits to total assets. The difficult years at the beginning of the millennium are clearly identified by the

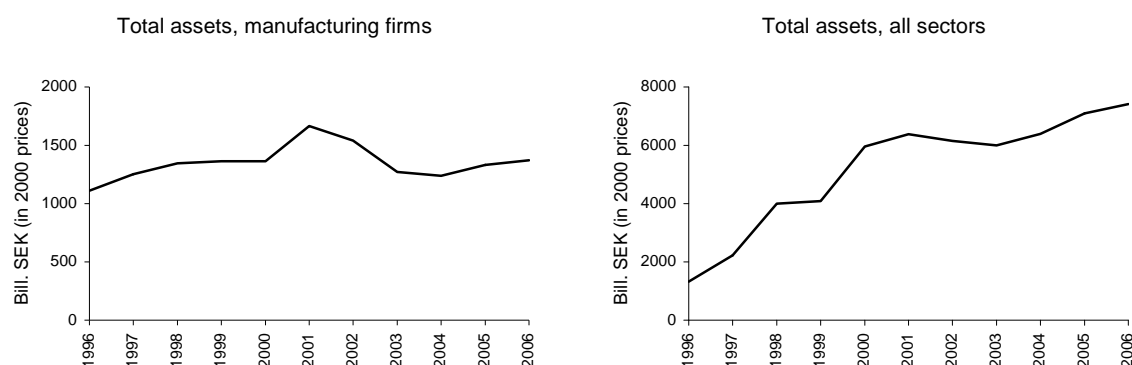
dip in all charts. After those years it seems as if all measures seem to stabilise at around a 10 per cent level except the profits to total assets measure for the all-sector sample. This sample has increased its amount of total assets significantly in recent years due to the inclusion of more financial banks. Because of this fact, the profitability measure has not recovered as much for this sample as for manufacturing firms.



NOTES: Data sources are rankings by *Sveriges största företag*, firms' annual reports and authors' estimates.

Figure 2.15: Development of rate of return measures for the 30 largest firms

Figure 2.16 illustrates the development of total assets according to the firms' balance sheets. For the manufacturing firms we see a small upward trend but, for the sample containing the 30 largest firms without industry restrictions, there has been a significant increase in wealth over the years 1996-2006 by more than 400 per cent. This increase is mainly due to strong balance sheets within the banking sector, which had no representatives among the 30 largest firms in the beginning of the studied time period but three towards the end.



NOTES: Data sources are rankings by *Sveriges största företag* and authors' estimates. Total assets have been deflated by GDP deflator (2000=100).

Figure 2.16: Development of total assets for the 30 largest firms

Location of foreign subsidiaries

The vast majority of the firms in the two datasets are enrolled in multinational activities. Most have subsidiaries in many foreign countries. To investigate such linkages with daughter companies around the world we employ the Orbis database provided by Bureau van Dijk Electronic Publishing. This database provides us with data on the geographical location of subsidiaries and their activities. Unfortunately, financial data and data on employment and industry classification are only available for a minority of affiliates. 20 per cent of the subsidiaries had employment data available and 24 per cent could be identified by industry classification. Data are more likely to be missing for smaller subsidiaries and for those located far away from Sweden. Even though only 20 per cent of the firms have employment data available, the share of total foreign employment covered by the Orbis database is 35 and 40 per cent respectively for the manufacturing and all-sector datasets. Hence, large subsidiaries are overrepresented in the dataset which should be kept in mind when interpreting Table 2.3 which presents data for 2006.

The geographical orientation of subsidiaries is rather similar for the two panels. The majority of affiliates are located in Western Europe and North America. The Nordic countries and other, mainly East European, countries also stand for a significant amount of foreign

subsidiaries. From the employment data we see that the Nordic and Baltic countries represent a higher share of total subsidiary employment in the all-sector sample than among subsidiaries to the top 30 manufacturing firms. This is due to the financial sector's rather high activity in countries neighbouring to Sweden.

For manufacturing firms, the average firm size seems to be largest in the Nordic countries and Western Europe and North America. In addition to these regions, the sample containing the service sector seems to have large subsidiaries in the Baltic region. Again, banks are responsible for these large subsidiaries. The last column reinforces this concentration of financial service subsidiaries in the Baltic region since the share of manufacturing employment is very small there. Finally, even though Swedish firms have a rather poor presence in Eastern Asia, the coverage is particularly poor for that region.

Table 2.3: Geographical location and employment of foreign subsidiaries of top 30 firms in 2006

<u>Panel A. Manufacturing firms</u>						
	<u>Number of firms</u>		<u>Number of employees*</u>		<u>Average firm size (nb of empl.)*</u>	<u>Share of employees in manufacturing (%)*</u>
	Sum	Share (%)	Sum	Share (%)		
Nordic countries	249	10,9	20527	12,0	82	54,7 [78]
Baltic countries	51	2,2	1994	1,2	39	78,8 [11]
Western Europe and North America	1270	55,5	109069	63,8	86	60,6 [272]
Eastern Asia	211	9,2	4031	2,4	19	71,6 [16]
Other countries	509	22,2	35285	20,6	69	45,7 [51]
Total	2290	100,0	170906	100,0		
<u>Panel B. All sectors</u>						
	<u>Number of firms</u>		<u>Number of employees*</u>		<u>Average firm size (nb of empl.)*</u>	<u>Share of employees in manufacturing (%)*</u>
	Sum	Share (%)	Sum	Share (%)		
Nordic countries	448	19,2	94606	28,1	211	18,3 [119]
Baltic countries	73	3,1	19037	5,7	261	6,9 [23]
Western Europe and North America	1189	50,9	218506	65,0	184	26,7 [273]
Eastern Asia	172	7,4	3678	1,1	21	68,8 [14]
Other countries	455	19,5	455	0,1	1	36,2 [59]
Total	2337	100,0	336282	100,0		

NOTES: Data source is the Orbis database. Starred columns have poor data coverage. Within brackets the last column reports the number of subsidiaries with both employment data and industry classification.

Conclusion

The description above indicates that internationalisation has influenced all of our key variables: employment, sales and R&D. For the 30 largest firms we see more and more activities taking place outside Sweden. About 65 per cent of the employment in the largest firms is in foreign activities. The majority of sales operations are occurring in foreign countries and for R&D we also note increased foreign activities. Hence, the 30 largest firms are becoming more and more international. Whether or not this benefits the home economy remains to be seen since the exploitation of economies of scale and low-wage production may generate other positive effects.

The analysis of rankings reveals a rather high stability, at least during the less turbulent later half of the studied time period. When it comes to the ownership structure, foreign companies increasingly own Swedish large firms, reflecting the wave of mergers and acquisitions in the late 1990s. More dominant positions have decreased, being yet another token of the importance of internationalisation and showing that the capital markets are very much intertwined through cross-ownership across borders. Similarly, the state's involvement in corporate ownership has diminished considerably over the last decade. This is a consequence of the liberalisation of many markets during the later decades of the last century.

Appendix: The 30 largest firms in Sweden in 2006

A. Manufacturing firms

Rank	Firm name	Number of employees
1	Volvo	82300
2	Ericsson	64486
3	Electrolux	55471
4	SCA	51022
5	Sandvik	40672
6	SKF	39780
7	Assa Abloy	31243
8	Scania	31195
9	Atlas Copco	24378
10	Autoliv Holding	24168
11	Trelleborg	22506
12	ABB Participation	19050
13	Volvo Personvagnar	18839
14	Baltic Beverages Holding	14134
15	Saab	12858
16	Lantmännen ek. för.	12833
17	Swedish Match	12465
18	Husqvarna	11412
19	Alfa Laval	9923
20	Astra Zeneca	9757
21	Bonnier	9721
22	SSAB	8737
23	Toyota Industries Sweden	8639
24	Sapa Holding	8232
25	Nobia	7968
26	Hexagon	7862
27	Getinge	7441
28	Sony Ericsson	7175
29	Gunnebo	6964
30	Solelectron Sweden Holding	6108

B. All sectors

Rank	Firm name	Number of employees
1	Securitas	215379
2	Volvo	82300
3	Ericsson	64486
4	Skanska	56085
5	Electrolux	55471
6	SCA	51022
7	Sandvik	40672
8	H & M	40368
9	SKF	39780
10	Posten	33395
11	Vattenfall	32308
12	Assa Abloy	31243
13	Scania	31195
14	Nordea	29248
15	TeliaSonera	26969
16	SAS	26554
17	Atlas Copco	24378
18	Autoliv Holding	24168
19	Nordstjernan	22749
20	Coop Norden	22523
21	Trelleborg	22506
22	SEB	20689
23	Samhall	19769
24	ABB Participation	19050
25	Volvo Personvagnar	18839
26	Swedbank	18623
27	Baltic Beverages Holding	14134
28	Capio TopHolding	13802
29	Saab	12858
30	Lantmännen ek. för.	12833

Chapter 3

Large corporations in the Danish economy

Torben Pedersen, Copenhagen Business School

Introduction

Background

The traditional viewpoint in Denmark has been that Danish industry mainly consists of many small and flexible firms and only few large multinationals – if any at all. This was to a large extent a fair description in the past, but in the last couple of decades we have witnessed significant changes in the industrial structure in Denmark as a number of more focused and globally oriented firms have outgrown many of the larger firms. The more focused firms have gained a larger role in Danish industry at the expense of old type conglomerates. These more focused firms typically have a very large world market share in specific niches and are often dominant players on the global scene in their specific niches i.e. true multinationals. Examples of such firms are Novo Nordisk for insulin, Vestas for wind turbines, Oticon for hearing aids, and Danisco for food ingredients. They are all number one or two in the world market in their specific niches. The appearance of this type of companies among the large firms marks a clear shift away from the nationally oriented conglomerates towards the more focused and globally oriented niche firms that are truly multinationals in the sense that they operate internationally in respect to sales as well as manufacturing, and research. They have created a global network of subsidiaries that is used to sell products as well as to source inputs abroad.

A sign of this shift towards a more global orientation among the largest firms is also found in the fact that Danish firms' outward FDIs (foreign direct investment) have outgrown and exceeded the inward FDIs every year since the late 1980's. Danish firms have evidently adjusted to the more global world in the last decades and expanded their global network of subsidiaries in order to take advantage of the new global opportunities in terms of increased

global sales, and also in terms of increased sourcing of cheap production and knowledge abroad. Most of the largest firms have reorganised and relocated their activities, so that the more standardized and routinized activities have been offshored to low-cost areas in Asia and Central and Eastern Europe, while most of the advanced and creative activities have been kept in Denmark. The exact implications of the changes for value added, employment, and innovation in Denmark from this process of change and global re-configuration among the largest firms that has unfolded during these years, still remain to be explored however.

Aims of the study

The aim of this country report is twofold: 1) to explore how the largest Danish firms restructure their activities globally; and 2) to investigate the role of the largest firms in the Danish economy for the time period 1996-2006. By focusing on the largest firms we expect to capture a large part of the dynamics in the Danish economy. The reorganization and relocation of activities in the largest firms have significant impact on the Danish economy and in this report we intend to disclose the structural changes in the firms themselves mainly with regard to employment, sales and R&D and examine the implications for the Danish economy.

Data sources and construction of datasets

The initial source of identifying the largest firms in Denmark measured by employment was the database “Mapping Corporate Denmark” (<http://www.corporate-denmark.dk/>). Mapping Corporate Denmark is an internet-based database that consists of key accounting figures of the largest 100 firms from 1970 and onwards. However, this database does not include any data on the international activities of Danish firms like international sales, production or R&D. Therefore, a lot of effort was put into collecting more data for each firm on their international activities. In particular, the goal was to be able to make a split between domestic and international activities for key figures such as sales, number of employees and R&D. In a few cases these data were available through the annual reports, but in most cases we had to approach the individual firms in order to obtain the needed data. As part of this process each firm has also

validated the data for their firm. It was only possible to gather the data on the international activities for the period 1996 to 2006, so we will only report the data for this period here.

Two parallel datasets were constructed: one that included the 30 largest manufacturing firms in Denmark measured by the total number of employees (Denmark and abroad) and another that included the largest manufacturing and service firms. The latter dataset includes at least 10 service firms for each year, so for a few years this dataset includes just over 30 firms. The difference in the two datasets is only the sectoral distribution which allows us to compare the changes taking place among all the largest firms irrespective of sector with the changes among the large manufacturing firms.

Data for the two datasets are also compared with data obtained from Statistics Denmark for a larger population of Danish firms in order to tease out the specific characteristics of the largest firms (compared to the total population of firms in Denmark).

Descriptive analysis

Stability in rankings

The beginning of the 1990's (just before our time window) was characterized by a number of significant mergers in Denmark even among the largest firms such as the slaughterhouses that merged into Danish Crown, mergers in the financial sector and mergers in other parts of the food industry. The implication of these mergers was a substantial change in the composition of the largest firms. In comparison, our time window, the recent period from 1996-2006, seems to be characterized by fewer changes in the composition of the largest firms.

The distribution of firms in the two datasets in terms of number of occurrences in the top 30 from 1996-2006 is shown in Figure 3.1. In total, 43 manufacturing firms and 44 firms from all sectors have been among the top 30 at least once during the studied time period. As can be seen from the figure, 19 firms remain among the 30 largest firms throughout the whole period (11 years) in both sets while a smaller number of firms only make the top 30 a few times.

The numbers indicate that over a period of a little more than ten years only two thirds of the firms remain among the largest 30 firms, while more than one third of the firms have disappeared from this list. Some of the more remarkable firms that have disappeared from the list over the years are Superfos (that failed badly when trying to expand in the US), Akzo Nobel (where the plant was closed by the foreign owners), Sophus Berendsen and ØK (two conglomerates that both were selling off some of their major divisions and subsidiaries), and finally the construction companies Monberg & Thorsen and Højgaard Holding A/S that were losing ground and slipped out of the list of the top 30-firms.

Those companies that have not been on the list in all of the 11 years seem to be fairly evenly spread over the scale, which indicates that the changes in the composition of the largest firms are mainly driven by forces internally to the firms rather than by external economic factors that would influence many firms simultaneously.

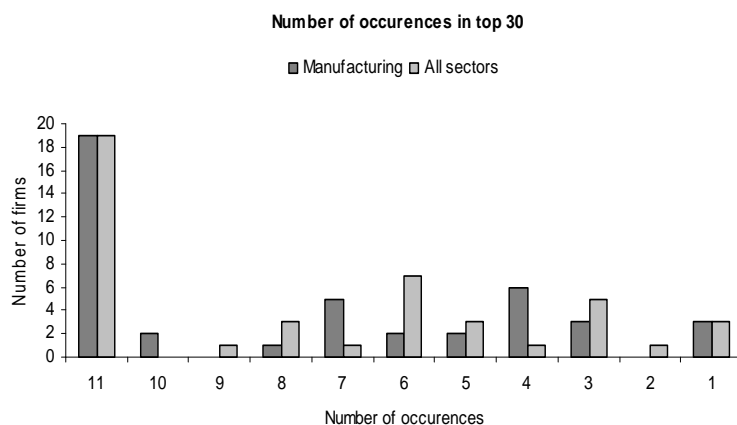


Figure 3.1: Distribution of firms in terms of occurrences among the 30 largest firms, 1996-2006

The rank stability of the firm composition in both datasets (manufacturing and all sectors) is depicted in Figure 3.2. A stability analysis has been carried out on the basis of Spearman rank correlation coefficients with the ranking of the firms based on total employment. The firms that are not among the top 30 in a particular year have been ranked as number 31. It shows from the analysis that the correlation is rather strong in the first three years in both samples, indicating modest change in the ranking of firms. However, from 1998 this pattern of stability in ranking changes and the correlations become considerably weaker around 1998 and onwards which signifies greater changes in the rankings in both groups and also more changes

in the composition of the top 30 firms. The most changes in rankings happened in the years 1998-2004 which were dominated by significant restructuring among the largest firms. These years coincide with the peak of the Danish stock market. The last years of the studied window from 2004 and onwards have again been dominated by less restructuring and changes in the ranking among the largest firms. During the last couple of years of the studied time period, correlations stay around 0.46 for manufacturing firms and 0.61 for all sectors. The rank stability is generally somewhat higher for the top 30 firms in all sectors than for the large manufacturing firms.

The firms that have most remarkably increased their ranking (jumped more than ten steps in the ranking) over the period 1996-2006 are Coloplast (continence care), Ecco (shoes), Velux (roof windows) and Vestas (wind turbines). These firms have in common that they are rather focused on one or a few core products where they have managed to obtain significant world market shares (if not become the world market leader). All four firms have also expanded much more abroad than in Denmark in terms of employment as they have established large manufacturing plants in Asia or Central and Eastern Europe.

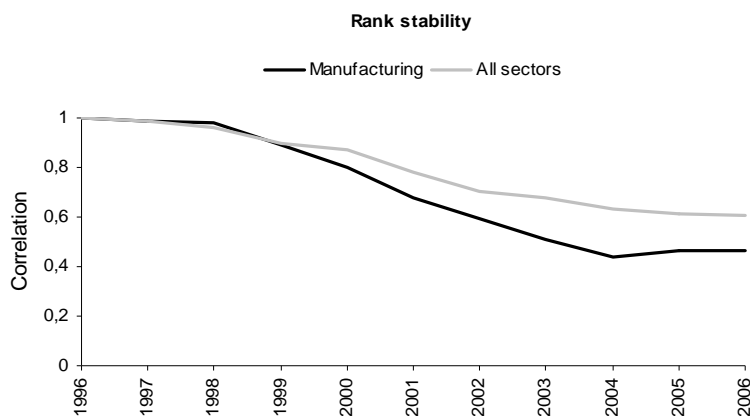


Figure 3.2: Rank stability for the firms in the dataset, 1996-2006. Spearman rank correlation coefficients

In Figure 3.3 is shown how the change in rank position varies with the average rank among the top 30 firms. This can tell us whether the changes in rank position are evenly spread over the top 30 firms or not. Both for manufacturing firms and all sectors we seem to have three groups of firms. First, the two firms with highest average ranking have been very stable with almost no changes in the ranking (in the all sectors ranking the two highest firms are literally

the same in all years), and then comes a group of approximately ten firms in terms of average ranking and more changes in the ranking, while the largest changes in ranking can be found among the firms with lowest average ranking. All in all, the larger the firms the more stable is their ranking within the group of the top 30 firms.

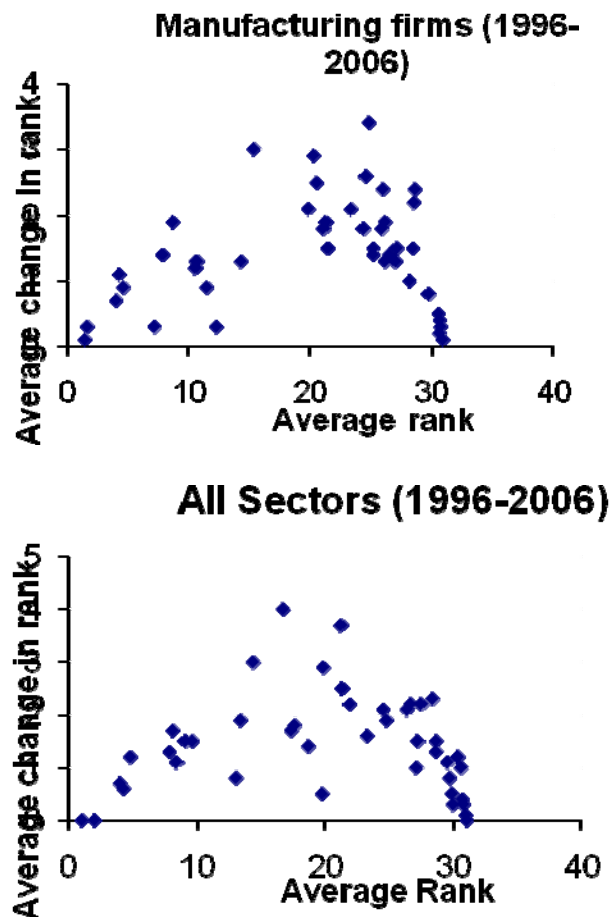


Figure 3.3: Average rank position and stability in the rank position

Statistics

Table 3.1 depicts selected firm-level characteristics for the 30 largest Danish firms from 2006 and 1996. A comparison with the total population of firms is also made. In the first half of the table the top 30 manufacturing firms are compared with the total population of manufacturing firms in Denmark, while the second half of the table compares the top 30 all sector firms with the total population of all firms in Denmark.

Table 3.1: Firm-level characteristics, 2006-1996

	Largest 30 firms		Total population*	
	2006	1996	2006	1996
<i><u>Manufacturing firms</u></i>				
Employees total (mean)	9,329	6,925	22 .	18
<i>Growth 1996-2006</i>	34.7%		22.2%	
Employees abroad (mean)	6,182	2,913	n.a.	n.a.
<i>Growth 1996-2006</i>	112.2%			
Share of foreign employees, %	66.3%	42.1%	n.a.	n.a.
Net sales (bill. DKK, mean)	16.0	7.6	7.8	3.8
<i>Growth 1996-2006</i>	110.5%		105.3%	
Foreign sales (bill. DKK, mean)	14.1	5.5	3.9	1.8
<i>Growth 1996-2006</i>	156.4%		116.7%	
Share of foreign sales, %	88.0%	72.1%	48.7%	43.3%
Net sales / empl.(mio. DKK),	0.17	0.11	0.14	0.09
<i><u>All sector:</u></i>				
Employees total (mean)	28,148	16,035	10	7 .
<i>Growth 1996-2006</i>	75.5%		42.9%	
Employees abroad (mean)	24,150	5,994	n.a.	n.a.
<i>Growth 1996-2006</i>	302.9%			
Share of foreign employees, %	85.8%	37.4%	n.a.	n.a.
Net sales (bill. DKK, mean)	36.4	13.5	9.4	4.9
<i>Growth 1996-2006</i>	169.6%		91.8%	
Foreign sales (bill. DKK, mean)	28.6	8.6	2.3	1.1
<i>Growth 1996-2006</i>	232.6%		109.1%	
Share of foreign sales, %	78.7%	63.3%	24.4%	22.2%
Net sales / empl.(mio. DKK),	0.13	0.08	0.09	0.07

Notes: Net sales have been deflated by GDP deflator (2000=100).

*) Data collected from Statistics Denmark

As expected, the average number of employees among the 30 largest firms has increased during the studied time period for both manufacturing firms and for firms in all sectors by 34.7% and 75.5%, respectively. The same is also the case for the total population of firms, but here the growth in number of employees is more moderate with 22.2% and 42.9%, respectively.

Moreover, for the top 30 firms the employment abroad has increased much more than the domestic employment. The share of foreign employment has risen from 42.1% in 1996 to 66.3% in 2006 among top the 30 manufacturing firms and from 37.4% to 85.8% for the large firms in all sectors. So although the larger firms are growing faster than the total population of firms, the bulk of this growth seems to be abroad.

In relation to net sales and the share of foreign sales, the amount has similarly increased over the same time period for the large firms to a foreign share of 88.0% in 2006 amongst the manufacturing firms and 78.7% for the firms in all sectors.

The net sales per employee can be seen as a proxy for the productivity and using this proxy for productivity indicates that the top 30 firms are generally more productive than the total population of firms. It is also remarkable that the gap in the productivity among the top 30 firms and the total population has increased in the period 1996-2006, where the larger firms have expanded abroad.

Table 3.2: Firm-level characteristics by sector, 2006

<i>All sectors, means</i>	Firms	Net sales, bill. DKK	Foreign sales bill. DKK	Total empl.	Empl. abroad
Total	30	36.35	27.18	28215	35054
Chemicals (24, 25)	4	17.42	17.18	10034	5349
Construction (26)	3	10.41	9.46	6595	4463
Electrical engineering (31, 33, 64)	3	23.10	13.41	10170	4914
Foods, textiles, apparel (15,16)	5	40.69	31.47	19853	12631
Mechanical engineering (29, 31)	3	23.80	23.11	15295	9709
Shipping and transport (61, 63)	3	115.02	95.22	45398	29543
Trade (51, 70)	3	22.58	5.24	10845	3962
Other manufacturing (19, 36)	2	6.91	6.55	8221	6874
Other services (65, 74, 75)	4	54.72	34.25	106427	97463

Notes: Net sales have been deflated by GDP deflator (2000=100).

In Table 3.2, the top 30 firms in all sectors in the last year of the studied time period have been categorised according to industries. The industry codes are noted in parentheses. The mean values for net and foreign sales as well as total and foreign employment illustrate an average firm in each industry. It shows that the average net sales in shipping and transport are noticeably higher than in any other industry. Furthermore it can be noted that average sales in

a handful of industries – namely in chemicals, construction, mechanical engineering and other manufacturing – almost exclusively cover sales abroad while trade is the only industry where average domestic sales surpass foreign sales. Domestic employment constitutes a somewhat significant part within all the industries, except for other manufacturing where it only adds up to 8%. While shipping and transport were sizeable in net sales, firms in other services (that e.g. include the world largest cleaning company ISS) appoint on average significantly more employees than firms in the other industries.

Manufacturing firms



All sector firms

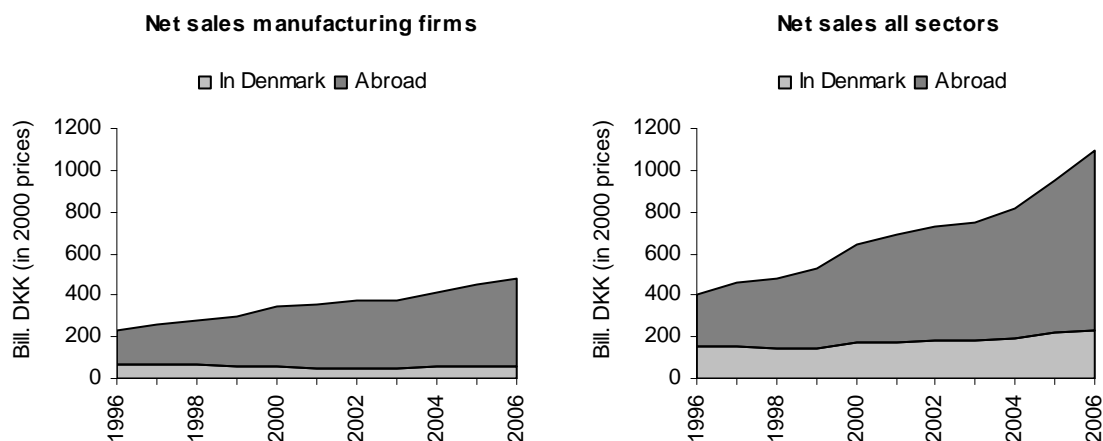


Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates.

Figure 3.4: The distribution of ownership types among the 30 largest firms in 1996 and 2006

The distribution of ownership types among the 30 largest Danish firms in 1996 and 2006 is illustrated in Figure 3.4. In relation to the manufacturing firms, the dominant ownership structure (that includes many foundations as owners) was the main type both in 1996 and 2006 with 12 and 13 occurrences, respectively. The number of foreign ownerships rose from three to five incidences over the same time period. In regards to firms in all sectors, the dispersed ownership form represented the main structure in 1996 with 14 firms. In 2006, however, this number had decreased to ten, while the dominant type ownership had become the leading type with 13 companies. The number of foreign owned firms in all sectors remained the same during this time frame with three companies. The family ownership is stable on a low level with around three to four occurrences in all groups.

Figure 3.5 illustrates the development of domestic and foreign net sales of the 30 largest firms in 1996-2006. While sales in Denmark for manufacturing firms have remained more or less constant over the time period with an average of 57 billion DKK, sales abroad have increased steadily, amounting to roughly 424 billion DKK in 2006 (in 2000 prices). Consequently, the share of foreign sales in total sales has increased, from 72.2% in 1996 to 88.0% in 2006. In comparison, domestic sales for firms in all sectors have increased, from 149 billion DKK in 1996 to 232 billion DKK in 2006. The foreign sales for firms in all sectors have equally increased, amounting to 858 billion DKK in 2006. The share of foreign sales in total sales has accordingly increased from 63.3% in 1996 to 78.7% in 2006.

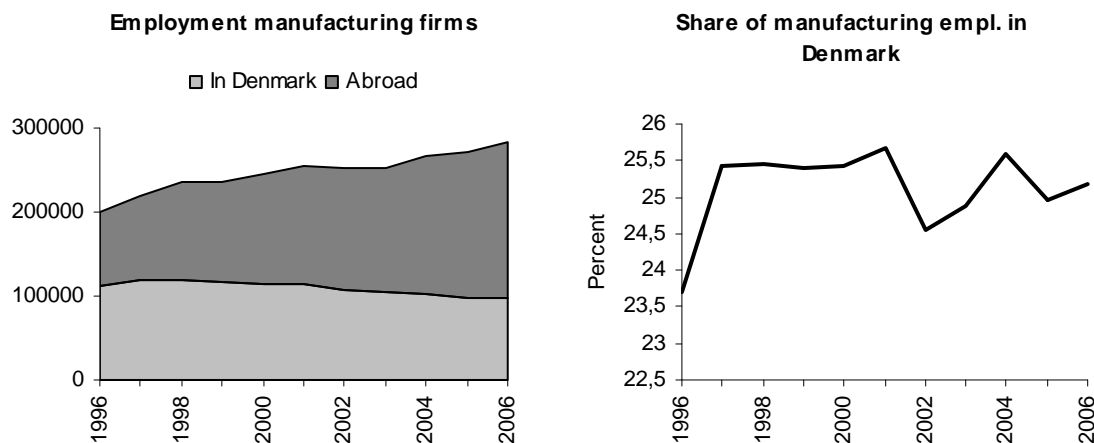


Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates. Net sales have been deflated by GDP deflator (2000=100).

Figure 3.5: Development of net sales for the 30 largest firms, 1996-2006

It is fair to say that the share of foreign sales was already high in 1996 with 72.2% for manufacturing firms and 63.3% for all sectors; however, it has further increased so that 80-90% of the total sales are taking place abroad in 2006. These companies are clearly focused outside the small Danish home market when it comes to sales and in particular the service companies have increased the share of foreign sales from 1996-2006.

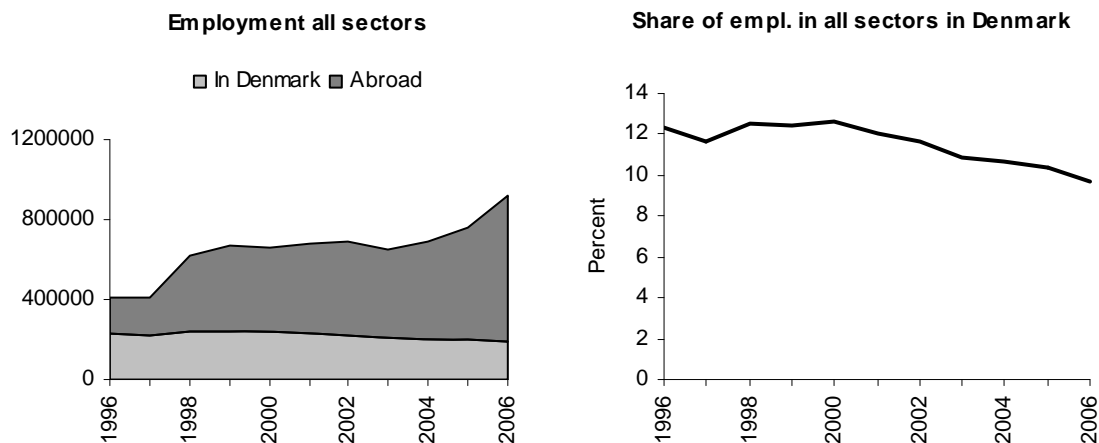
In Figure 3.6 are shown comparable figures for employment at home and abroad as the development of domestic and foreign employment in the 30 largest manufacturing firms is depicted next to their share of total manufacturing employment in Denmark. There is some variation during the studied time period, but the general picture shows that total employment in manufacturing firms is increasing significantly. In relation to the domestic and foreign division, employment in Denmark has decreased slightly from about 112,200 in 1996 to about 98,700 in 2006, while international employment has increased by 112.3%, from about 87,300 employees in 1996 to roughly 185,500 in 2006. The share of foreign employment in total employment has thus increased from 43.7% to 65.3% during the time period. In relation to the firms' share of total manufacturing employment in Denmark, the figure shows an increase from 23.7% in 1996 to 25.2% in 2006 (but this increase was mainly in the first year and the share has been rather stable around 25% since 1997).



Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, author's estimates, and Statistics Denmark.

Figure 3.6: Development of employment in the 30 largest manufacturing firms and their share of total manufacturing employment in Denmark, 1996-2006

While the employment in Denmark has been relatively constant with a slight decreasing trend (so the manufacturing sector is becoming smaller in Denmark) the foreign employment has increased substantially resulting in the share of foreign employment increasing quite dramatically. The share of foreign employment among the largest firms has increased more than the share of foreign sales, so more than two thirds of the employees of the large Danish firms are employed abroad. This is a result of more firms setting up production and research centres abroad in order to take advantage of low costs and talented people in other geographical locations. A number of the younger more focused firms that have entered the group of large firms like Ecco Sko, Coloplast and Vestas are good examples of this trend as they have all established significant production units in low cost countries like China, Hungary etc.

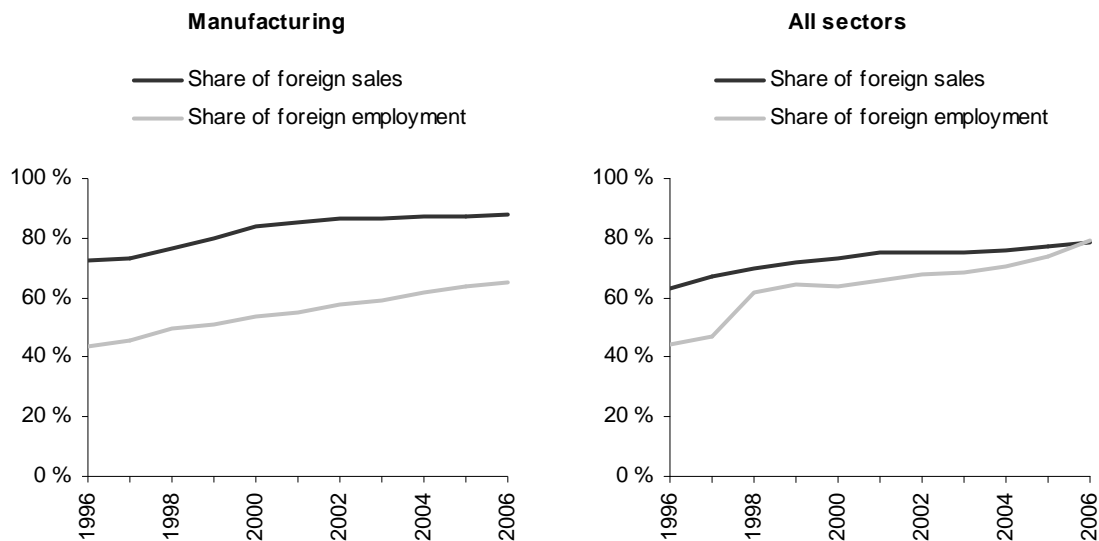


Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, author's estimates, and Statistics Denmark.

Figure 3.7: Development of employment in the 30 largest firms in all sectors and their share of total employment in Denmark, 1996-2006

The development of domestic and foreign employment in the top 30 firms in all sectors as well as their share of total employment in Denmark can be seen in Figure 3.7. Similar to the development of the manufacturing firms, domestic employment in all sectors has decreased slightly by 14.8% from about 227,800 in 1996 to roughly 193,100 in 2006, while employment abroad has increased considerably – by approximately 302.8% in the ten years. The share of foreign employment in total employment has consequently increased from 44.2% in 1996 to 79.0% in 2006. As regards total Danish employment in all sectors, the share of the top 30 firms has decreased from 12.3% in 1996 to 9.7% in 2006.

The shift from Danish jobs to foreign jobs is even more pronounced for the 30 largest firms in all sectors as the share of foreign employment has increased from 44.2% to 79.0% in 2006. Service companies like A.P Møller and ISS are key exponents for this development as they both have more than 75.000 employees abroad at the end of the period – or each of the two companies has almost as many employees abroad as all the 30 largest manufacturing firms have together in Denmark.

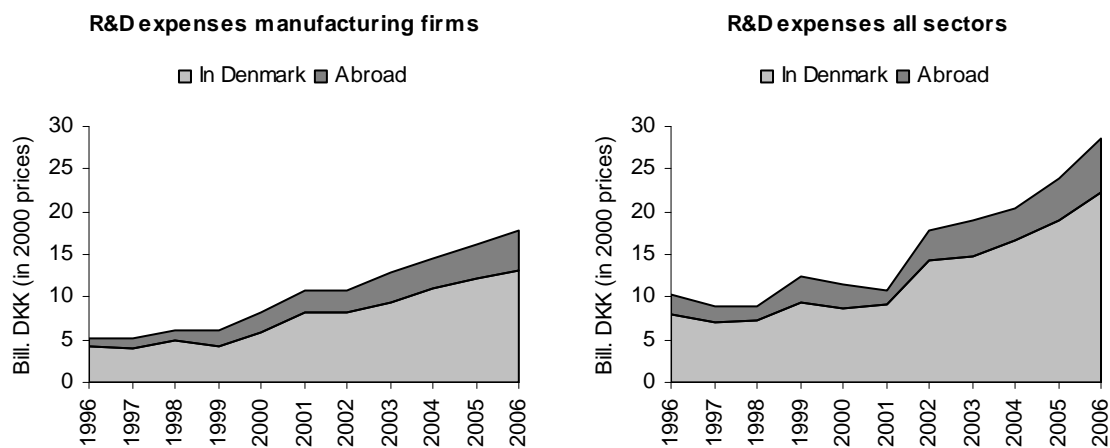


Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates. Net results have been deflated by GDP deflator (2000=100).

Figure 3.8: Total share of foreign employees and foreign sales of the top 30 firms

In Figure 3.8, the share of foreign employees and foreign sales to the total of largest 30 firms within manufacturing as well as firms from all sectors is illustrated. In this, a steady increase of all the ratios during the investigated time frame is evident. It is further apparent that the share of foreign sales in regards to manufacturing firms has been significantly larger throughout the whole time period from 1996 to 2006, with an average share of foreign sales at 82.5% compared to a 55.1% share of foreign employment. However, as discussed above, the share of foreign employment is increasing most, which indicates a shift away from export from Denmark towards more local production and local sourcing of components and local talent.

The relationship between the share of foreign sales and employment with firms from all sectors has a different pattern as service firms typically must produce their services where it is consumed, so they cannot disconnect production and consumption in the same way as manufacturing firms. What is remarkable for the large firms in all sectors is the high share of both foreign sales and foreign employment and also that the share of foreign employment actually exceeded the share of foreign sales in 2006 with 79.0% over 78.7%. Not just the large manufacturing firms are highly internationalized, but this is certainly also the case for the large service firms in Denmark.



Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates. R&D expenses have been deflated by GDP deflator (2000=100).

Figure 3.9: Development of R&D expenses of top 30 firms, 1996-2006

The development of R&D expenses for the 30 largest firms is illustrated in Figure 3.9, and which shows a steady growth in total expenses for both manufacturing firms and firms in all sectors. As for the former, the expenses climb from 5.4 billion DKK in 1996 to 17.6 billion DKK in 2006, while the expenses for firms in all sectors increase from 10.3 billion DKK to 28.6 billion DKK over the time period. Clearly, domestic R&D dominates considerably throughout the period for both groups, but the share of foreign R&D expenses does nevertheless increase steadily. In 1996, foreign expenses for manufacturing firms amount to 1.0 billion DKK, thus constituting 19.6% of the total, while it makes up 26.8% in 2006 with 4.8 billion DKK. Similarly, foreign expenses for firms in all sectors increase from 2.3 billion DKK in 1996 to 6.2 billion DKK in 2006.

The R&D-activities are clearly the least internationalized of the activities we focus on here with a share of around 25% of R&D expenses conducted abroad compared to 80-90% for foreign sales and 65-80% for foreign employment. The firms are still reluctant to move the R&D-activities abroad as these are seen as core activities of the firms that need to be located close to the headquarter in Denmark. However, also the R&D-activities are becoming more internationalized with an increase from less than 20% foreign R&D in 1996 to more than 25% in 2006.

In Figure 3.10, the development of R&D expenses compared to the development of its share of net sales is shown for both the largest manufacturing firms and all sector firms. The R&D expenses are increasing over the years for both the manufacturing firms and all sector firms so that the total R&D expenses are two to three times higher in 2006 than in 1996. However, only the large manufacturing firms are increasing the R&D expenses more than the net sales, so the R&D-intensity of the firms is increasing (from 2% to 3.6%). For all sector firms the R&D-intensity is not actually increasing, but remains rather stable around 2-2.5%.

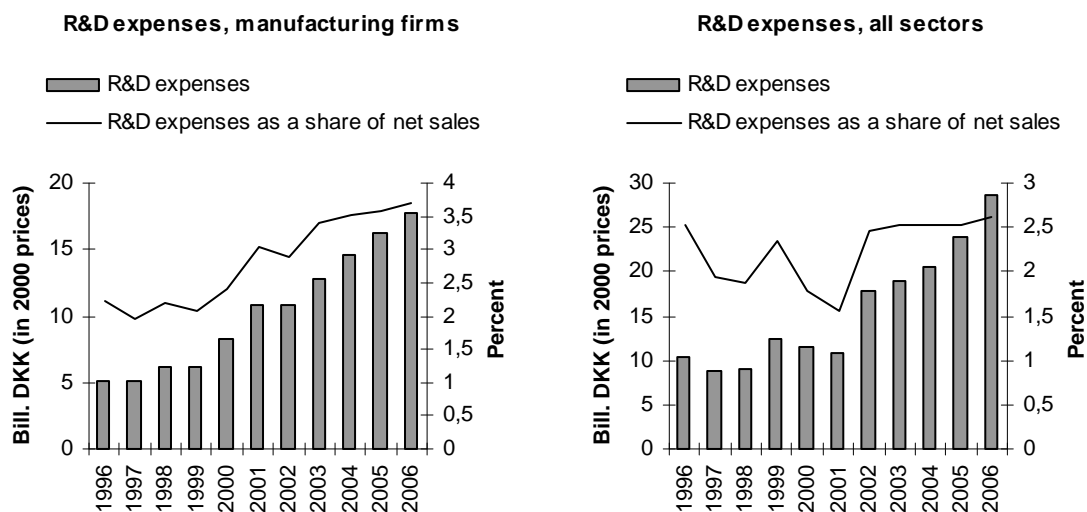
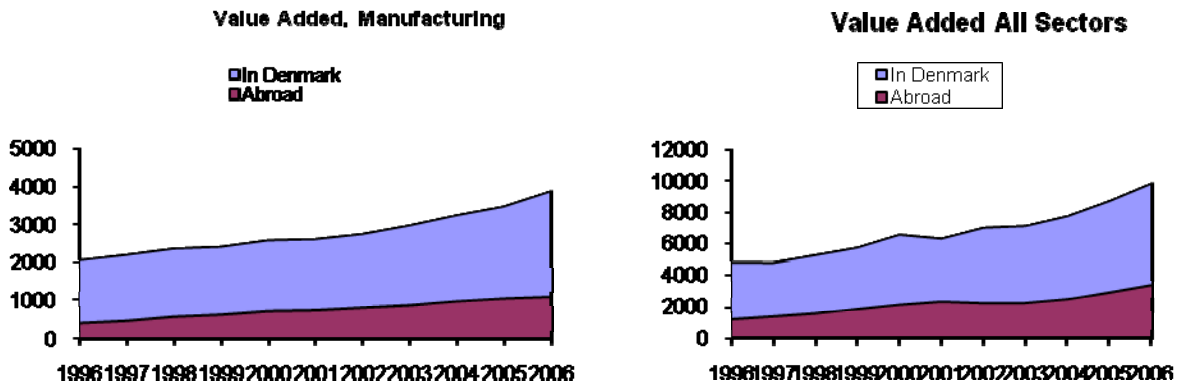


Figure 3.10: Development of R&D expenses for the 30 largest firms in total and as share of net sales, 1996-2006

In Figure 3.11 is shown the value added in Denmark and abroad for both the top manufacturing firms and all sector firms. As can be seen, over the whole period the value added has increased in both in Denmark and abroad – and this is true both for manufacturing and all sector firms. However, with a larger share abroad than in Denmark, which follows

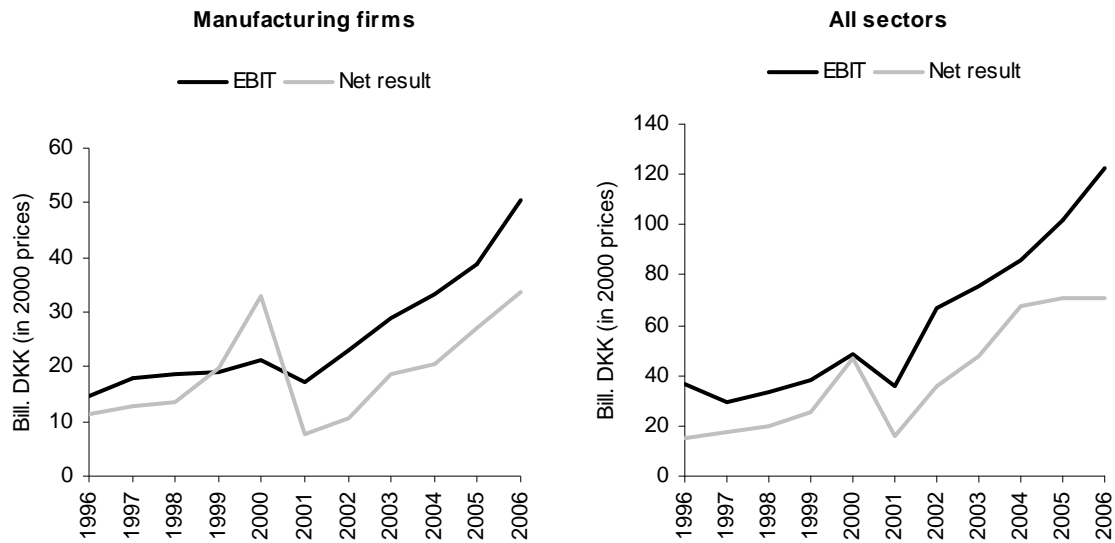
naturally from the fact that more activities in terms of sales and employment are taking place abroad. In line with the other measures this also points to the fact that the centres of gravity of the firms are slowly moving out of Denmark.



Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates. Value Added is calculated as the sum of payment to capital owners (EBIT) and employees (total salary expenses).

Figure 3.11: Value added in Denmark and abroad for manufacturing and all sectors

In Figure 3.12, the relationship between EBIT and net results of the top 30 firms is depicted. As can be seen from the figure, both EBIT and net results have increased from 1996 to 2006 for both manufacturing firms and for firms in all sectors. In the former, net results constituted 76.9% of EBIT in 1996 compared to 66.6% in 2006. In the latter, net results made up 41.6% of EBIT in 1996 in contrast to 57.8% in 2006.



Notes: Data sources are Mapping Corporate Denmark, firms' annual reports, and author's estimates. EBIT and net results have been deflated by GDP deflator (2000=100).

Figure 3.12: Development of EBIT and net results of top 30 firms, 1996-2006

Discussion and conclusions

The analysis presented above clearly shows that the largest Danish firms both in manufacturing and in other sectors are highly internationalized on almost all dimensions. In particular sales and employment are internationalized, but also the internationalization of R&D is increasing. The level of internationalization of Danish firms was already high in 1996, but it has increased further by 2006. This is to a large extent a result of a number of new and more focused and globally oriented firms that have entered the group of the largest firms in the studied time period. An illustrative example is the Vind Turbine Company Vestas that entered the list of the largest manufacturing firms as no. 27 in 2000 and in 2006 was listed as no. 8 with almost 20.000 employees.

Although the expansion abroad to some extent has been at the expense of growth at home the most significant pattern is that the activities in Denmark are only moderately decreasing while the shift is mainly caused by the significant expansion abroad. By 2006 65-80% of all employees in the large Danish firms were employed abroad indicating that the centre of gravity is moving. There is no doubt that a number of Danish firms in the last decade have

established not just sales units but also production and R&D units abroad in order to take advantage of low cost production and the availability of talented people.

Appendix: The 30 largest firms in Denmark in 2006

A. Manufacturing firms

Rank	Firm name	Number of employees
1	Carlsberg A/S	31680
2	Danish Crown Gruppen	25159
3	Novo Nordisk A/S	23172
4	Danfoss A/S	20008
5	Arla Foods Gruppen	17933
6	Velux Industri A/S	14887
7	Poul Due Jensens Fond (Grundfos Group)	14542
8	Skandinavisk Holding A/S	12216
9	Ecco Sko A/S	11520
10	Vestas Wind Systems A/S	11334
11	Danisco A/S	10272
12	Rockwool International A/S	8017
13	Coloplast A/S	7247
14	FLS Industries A/S (FLS)	6862
15	NKT Holding A/S	6016
16	GN Store Nord A/S	5483
17	H. Lundbeck A/S	5171
18	Lego Company A/S	4922
19	William Demant Holding A/S	4797
20	Novozymes A/S	4544
21	Vest-Wood A/S	4321
22	Egmont Fonden	3842
23	Icopal A/S	3734
24	Monberg & Thorsen A/S	3673
25	Sauer-Danfoss Holding ApS	3649
26	LM Glasfiber Holding A/S	3173
27	Axcel II A/S	3106
28	Dantherm A/S	3100
29	Leo Pharma A/S	2985
30	Chr. Hansen Holding A/S	2495

B. All sectors

Rank	Firm name	Number of employees
1	ISS A/S	391356
2	A.P. Møller – Mærsk A/S	114590
3	Carlsberg A/S	31680
4	Danish Crown Gruppen	25159
5	Novo Nordisk AS	23172
6	Danfoss A/S	20008
7	Den Danske Bank	19253
8	TDC A/S	19011
9	Arla Foods Gruppen	17933
10	DSV A/S	16404
11	Velux Industri A/S	14887
12	Poul Due Jensens Fond (Grundfos Group)	14542
13	Skandinavisk Holding A/S	12216
14	Ecco Sko A/S	11520
15	Fællesforeningen for Danmarks Brugsforeninger (FDB)	11511
16	Vestas Wind Systems A/S	11334
17	Falck A/S	10301
18	Danisco A/S	10272
19	Rockwool International A/S	8017
20	Coloplast A/S	7247
21	FLS Industries A/S (FLS)	6862
22	IBM Danmark A/S	6138
23	NKT Holding A/S	6016
24	GN Store Nord A/S	5483
25	Vesterhavet A/S (JL)	5200
26	H. Lundbeck A/S	5171
27	Lego Company A/S	4922
28	Rambøll Gruppen A/S	4905
29	William Demant Holding A/S	4797
30	Novozymes A/S	4544

Chapter 4

Large corporations in the Finnish economy

Mika Pajarinen and Pekka Ylä-Anttila, ETLA (The Research Institute of the Finnish Economy)

Introduction

Background

The 1980s saw a swift internationalization of large manufacturing firms in Finland. Compared to many other small industrial countries the stage of rapid internationalization started relatively late. The process was led by the largest manufacturing corporations of which many were still quite diversified at that time. Foreign expansion took place through mergers and acquisitions in the lines of business in which the companies were already operating. It was a matter of extensive growth abroad which in many cases benefited the home country operations through economies of scale.¹ Hence, the large industrial companies increased their role in the Finnish economy and especially as leaders in the booming outward foreign direct investment.²

The 1990s were quite different in many respects. The FDI boom continued, and even accelerated, but large corporations adopted a much more focused strategy and specialized in their core businesses globally. Hence, there was a lot of divestment both in the home country and internationally, coinciding with large and more focused foreign acquisitions.³ The 1990s also saw an increasing internationalization of service industries, notably retail trade and IT services. Many of the service firms, especially in the IT industry, represent the SME sector rather than big business. Formation of the European internal market and Finland joining the EMU, and the subsequent removal of the currency risk in the European market, have further facilitated the internationalization process of SMEs in the new millennium.

¹ See Mannio, Vaara & Ylä-Anttila (2003).

² Cf. Braunerhjelm, Heum & Ylä-Anttila (1996).

³ Anecdotal evidence is given in Mannio et al. (2003).

Obviously, the role of the largest firms both in the domestic economy and in the internationalization of business sector has changed during the past decades. It is likely, however, that the largest corporations are still of great importance in the economy, especially in the strategic areas like R&D and foreign activities.

Aims of the study

This study looks at the role of the largest corporations in the Finnish economy over the past 20 to 30 years. We are especially interested in how the significance of these heavyweights has changed as a consequence of the transformation of the international market environment and European integration. Another important factor that has obviously changed the firm dynamics among the group of the large companies as well as the position of these firms in the economy is information and communication technologies and the networking of activities that has been enabled by these technologies. Large manufacturing firms have increasingly split their production processes or value chains into smaller units with different geographical locations. Off-shoring of stages of production is today possible without losing control of the production process – thanks to modern ICT.⁴ This has probably influenced strongly on firm size and organization, as well as governance and management practices. The core organizations might have become smaller but networks or international alliances have become larger. Financial entity – the legal firm that publishes financial statement – might be very different from the relevant organization consisting of formal (contract-based) or informal relations and networks.

The aim is, by examining the changes in the role of the large firms in the economy, to reveal some essential features of the structural transformation.

Data sources and construction of datasets

The important source of our firm-level data is a database based on the annual top 500 firms in Finland surveys carried out by Talouselämä magazine. This database includes financial data

⁴ Baldwin (2006) calls this “second unbundling” meaning the globalization takes place now at the level of different tasks or activities rather than at the level of industries, sectors, firms, or skilled groups.

from 1986 onwards as well as some variables describing the international operations of firms. Unfortunately, data on international operations are available only since 1996. This restricts the time horizon of analysis to 1996-2006, as we want to divide employment, sales, and some other key variables into domestic and foreign components. However, we can link this dataset to the earlier constructed Nordic database on the internationalization of large firms which has been used, for instance, in the study of Braunerhjelm et al. (1996) and thus we are able to extend the time span of the study in some dimensions even to the 1970s. In addition, we are able to search for any missing firm-level data from other financial databases available at the Research Institute of the Finnish Economy (ETLA).⁵ Finally, at the late stages of the study we obtained access to the Orbis database managed by Bureau van Dijk Electronic Publishing (BvDEP). From this database we are able to search, for instance, the location of foreign subsidiaries of the firms analyzed in our study.

We construct two parallel datasets. Both datasets are based on the top 500 firms list. The first one consists of the year-by-year listings of the 30 largest manufacturing firms measured by total employment (i.e. employment includes both employment in Finland and abroad). This dataset is equal to data used in the former Nordic database (Braunerhjelm et al., 1996). We merge these two datasets. The second dataset consists of the annual listings of the 30 largest firms in all fields, conditional to the fact that every year there have to be at least ten firms from sectors other than manufacturing. This means that in this dataset there can, in fact, be more than 30 firms per year. However, only in 1996 (31 firms) does the number of firms exceed 30. We link both datasets to the nation-wide production, employment, and other relevant databases, which enables us to analyze the significance and changes of large firms' role in the economy.

⁵ These sources include the Balance Consulting database which has financial information on several thousand firms from the years 1994-2004, and the Suomen Asiakastieto Ltd. database which basically consists of all firms reporting publicly financial statements and covers the years 1999-2006.

Descriptive analysis

Stability in rankings

There are in total 51 firms in the manufacturing dataset and 57 firms in the dataset including all sectors that have been among the top 30 firms in 1996-2006. As we can see from Figure 4.1, in both samples 14 firms have been among the top 30 firms every year. On the other hand, there are a number of firms that appear only a few times in the data. In order to study the stability of the composition of firms in the datasets we calculate the Spearman rank correlation coefficients. We rank the firms in terms of total employment. In addition, all firms not qualifying among the top 30 in a certain year are ranked as 31.

Figure 4.2 depicts the rank correlations for the two periods. The charts on the left show the correlation between the year 1996 and the subsequent years, and the charts on the right illustrate the correlation between the year 2000 and the subsequent years. The charts on the left indicate that the correlation weakens quite rapidly when we start the analysis from 1996. On the other hand, when starting from 2000 (the charts on the right), the rank correlation weakens notably less rapidly. This indicates that the late 1990s may have been a more turbulent period in terms of mergers and acquisitions, or other restructuring processes among the firms in the data, than the early years of the new millennium.

To further analyze the stability of rankings, we plot the average rankings against the deviation of the rankings in Figure 4.3. The charts on the left include all firms appearing in the datasets and the charts on the right only the 30 firms with the highest average ranking. The charts indicate that the larger firms in general tend to be somewhat more stable in their rankings than the smaller ones. The top four firms, in particular, seem to be strong performers in terms of stability in their rankings.

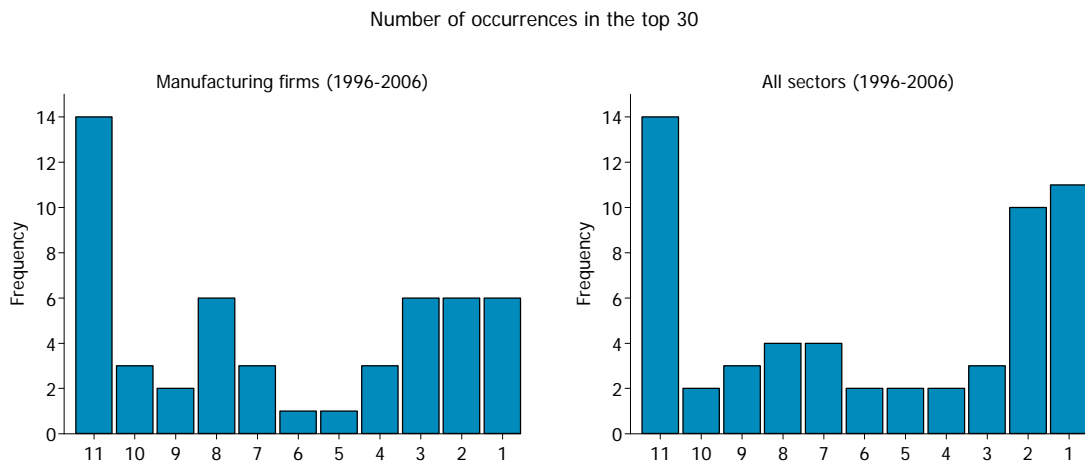
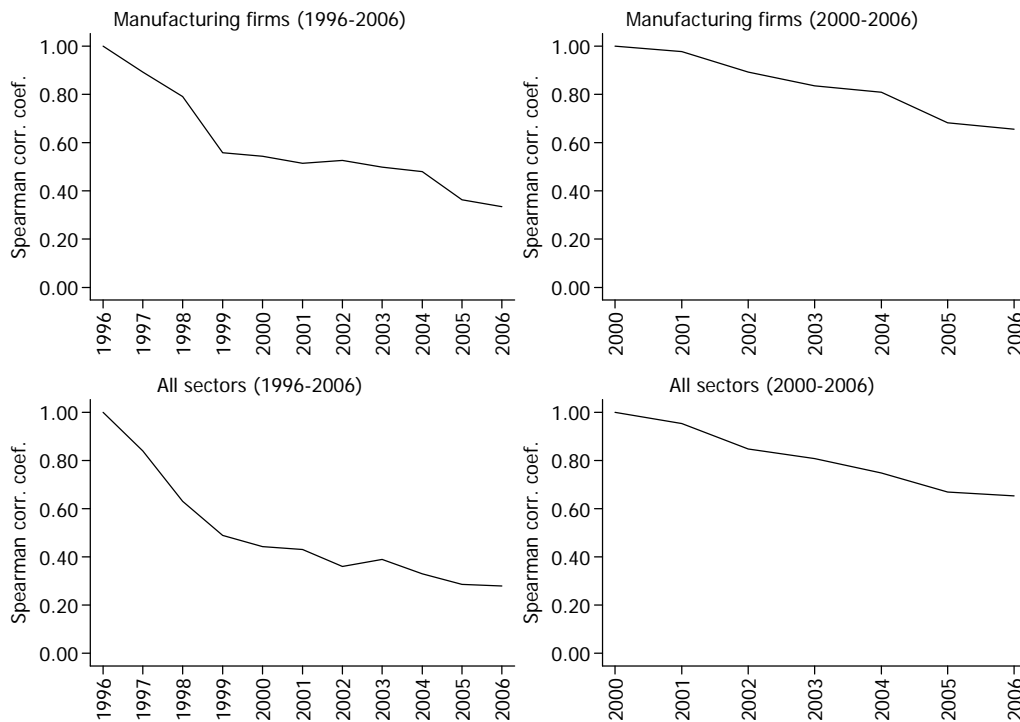
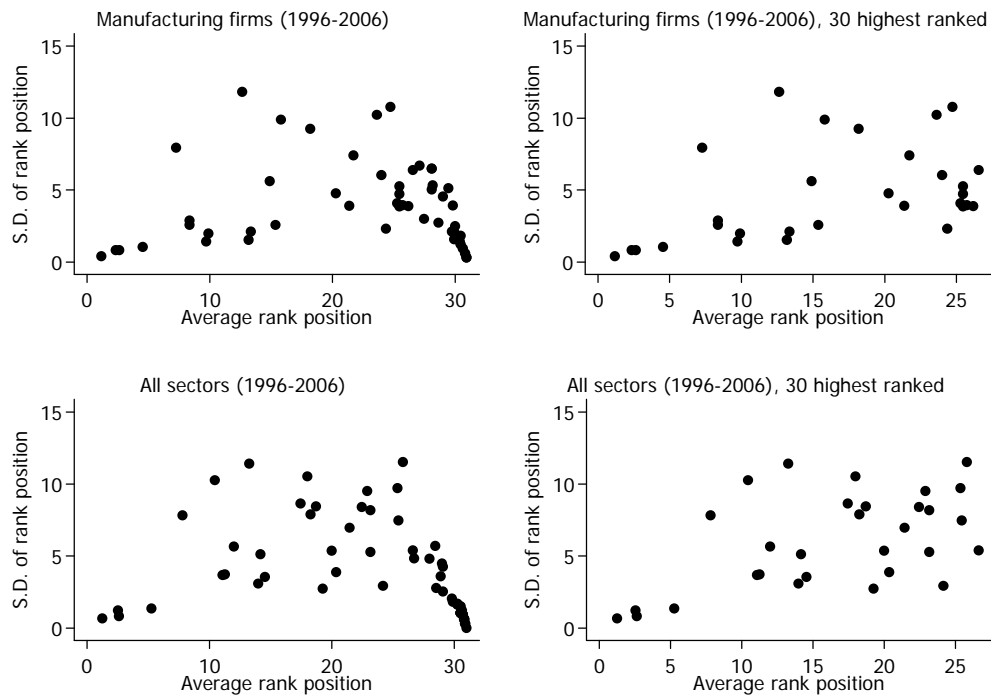


Figure 4.1: Distribution of firms in terms of occurrences among the 30 largest firms



Notes: The charts depict the Spearman rank correlation coefficients between the first year of interest and the subsequent years.

Figure 4.2: Rank stabilities for the firms in the datasets



Notes: The charts on the left include all firms appearing in the data and the charts on the right only the 30 firms with the highest average rank.

Figure 4.3: Average rank position and stability in the rank position

The role of the 30 largest firms in the Finnish economy

The 30 largest – Are they different?

Table 4.1 depicts some selected characteristics of the 30 largest firms in the last year of observations (2006). In the table we use other top 500 firms as a reference group. We report the means and standard deviations of the selected variables in the both groups and the significance of the t-test which tests the equality of the means.

Quite naturally the 30 largest firms are in both panels significantly larger than other top 500 firms both in terms of total and foreign employment, and total and foreign sales. However, also the *ratios* of foreign to total employment and foreign to total sales are significantly higher in the 30 largest firms. In the manufacturing sample, 68% of the 30 largest firms' employees work abroad and the share of foreign sales is 72%. In the rest of the top 500 firms the shares are 17% and 12%, respectively. In the sample without industry restrictions, 52% of the 30

largest firms' employees work abroad and the share of foreign sales is also 52%. In the rest of the top 500 firms the shares are 14% and 9%, respectively.

In both samples, proxies for labour productivity⁶ and R&D intensity⁷ seem to have on average lower values in the group of top 30 firms than in the group of other large firms. In addition, in manufacturing financial strength measured by equity ratio is on average lower in the 30 largest firms compared to other large manufacturing firms. Further, in the all sectors sample, the top 30 firms have on average lower profitability in terms of return on total assets. In this sample, the share of firms in the trade sector is also lower among the top 30 firms than among the rest of top 500 firms.

As may be expected, the 30 largest firms are on average older than other firms. Although many mergers and acquisitions and other restructuring processes potentially create difficulties for ex post studying the history and defining the age of firms, we have defined at least an approximation of the foundation year for all the firms in the 30 largest firm datasets in 2006. In the manufacturing sample the mean of age in 2006 is 58 years and the median 62 years. In the sample including all sectors, the mean age in 2006 is 56 years and the median 55 years. Unfortunately we have no comprehensive data on the age profile of all top 500 firms. However, we can compare the values to the whole firm population data in Finland: the mean age in the whole firm population in Finland was 12 years in 2006, and the median 10 years. These values are remarkably lower than the 30 largest firms' values.

⁶ The ratios of value added to employees and net sales to employees.

⁷ The ratio of r&d expenditure to net sales.

Table 4.1: Some firm-level characteristics in 2006

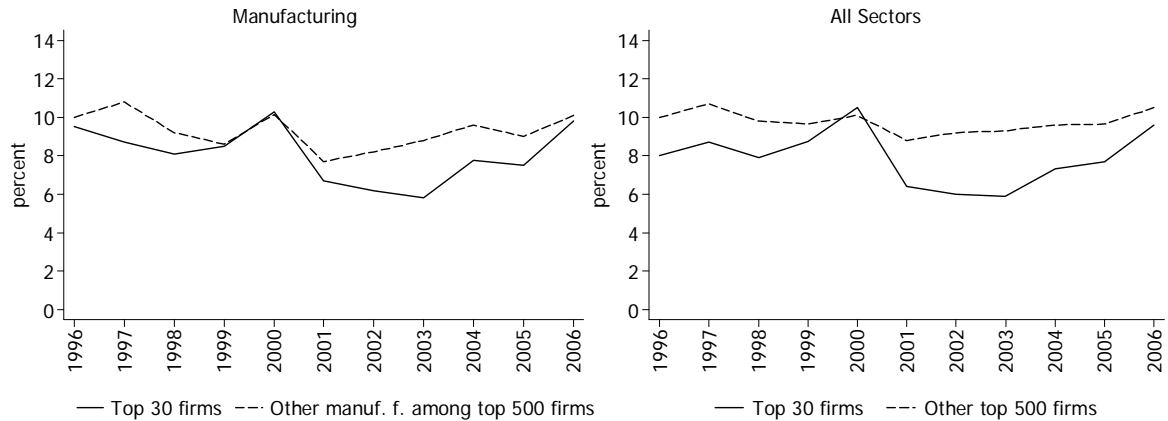
	Largest 30 firms		Other top 500 firms		T-test
	Mean	S.D.	Mean	S.D.	Signif.
<u>Panel A. Manufacturing firms</u>					
Total employment	14 036	13 872	933	1 059	***
Employees abroad	9 656	9 670	287	679	***
The share of foreign employees, %	68.3	26.4	17.1	25.0	***
Net sales, me	4 308	7 665	329	990	***
Foreign sales, me	3 596	7 637	83	377	**
The share of foreign sales, %	72.4	29.5	11.7	24.0	***
Industry (shares)					
Foods, textiles, apparel (15-19)	0.13	0.35	0.13	0.34	
Pulp and paper (20-21)	0.13	0.35	0.10	0.30	
Chemicals (23-25)	0.13	0.35	0.14	0.35	
Mech. engineering (27-29, 34-35)	0.27	0.45	0.29	0.46	
Electr. engineering (30-33)	0.17	0.38	0.10	0.30	
Other manufacturing (22, 26, 36-41)	0.17	0.38	0.25	0.43	
Net sales / empl. (mill. e)	0.3	0.2	1.0	3.7	***
Value added / empl. (1000 e)	66.3	39.1	139.1	465.5	*
R&D/Net sales, %	1.7	2.1	3.0	7.1	+
Return on total assets, %	10.3	7.0	12.0	12.2	
Equity ratio (Equity/Total assets), %	42.4	12.0	47.8	19.9	*
<u>Panel B. All sectors</u>					
Total employment	17 606	12 693	1 038	1 355	***
Employees abroad	9 834	9 855	299	880	***
The share of foreign employees, %	51.7	31.2	13.5	24.2	***
Net sales, me	5 063	7 577	379	838	***
Foreign sales, me	3 580	7 667	58	273	**
The share of foreign sales, %	51.5	36.9	8.9	21.7	***
Industry (shares)					
Foods, textiles, apparel (15-19)	0.03	0.18	0.06	0.23	
Pulp and paper (20-21)	0.10	0.31	0.04	0.19	
Chemicals (23-25)	0.07	0.25	0.06	0.24	
Mech. engineering (27-29, 34-35)	0.20	0.41	0.12	0.33	
Electr. engineering (30-33)	0.10	0.31	0.04	0.20	
Other manufacturing (22, 26, 36-41)	0.10	0.31	0.10	0.30	
Construction (45)	0.07	0.25	0.02	0.13	
Trade (50-52)	0.07	0.25	0.30	0.46	***
Transport (60-64, ex. 642)	0.10	0.31	0.04	0.19	
Telecom., software (642, 72)	0.03	0.18	0.03	0.16	
Other services	0.13	0.35	0.20	0.40	
Net sales / empl. (mill. e)	0.3	0.2	2.7	29.4	*
Value added / empl. (1000 e)	72.2	54.3	142.3	424.0	***
R&D/Net sales, %	1.8	2.2	2.9	6.6	'
Return on total assets, %	9.4	6.2	12.3	12.1	**
Equity ratio (Equity/Total assets), %	45.9	14.7	45.3	19.4	

Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, company reports, and author's estimates. NACE Rev. 1.1 industry codes are in the parenthesis. Statistical significance: *** p<0.01, ** p<0.05, * p<0.10, + p<0.15, ' p<0.20.

Have the largest firms been underperformers in terms of profitability?

The top 30 firms have been fairly profitable ones during 1996-2006. The median of the return on total assets (ROA) over the whole period has been 8.1 per cent (mean 8.9 per cent) in the manufacturing sample and in the all sectors sample 8.0 per cent (mean 8.5 per cent). As Table 4.1 preliminarily indicated, the 30 largest firms, however, seem to be underperformers in terms of profitability compared to other large firms in the Finnish economy. Calculated over the whole period of 1996-2006, both the mean and median values of ROA are statistically significantly lower in the group of top 30 firms than in the group of the rest of the top 500 firms. To illustrate, Figure 4.4 depicts the top 30 firms' profitability in 1996-2006; the reference group is other top 500 firms. As we can see, apart from the few years around the millennium, the 30 largest firms have performed on average less satisfactorily than other large firms. The differences in the performance are statistically significant at 10 per cent level in 1996-1997, and in 2003-2004 in the case of manufacturing, and in 1996-1998, and 2001-2005 in the case of all sectors.

It should be stressed that the results we have presented here are merely preliminary evidence because we have compared only unconditional means and medians of the two groups. In order to obtain a more profound view we should control in more detail for example the industry and the size of firms. Furthermore, as we can see from Table 4.1, top 30 firms seem to be significantly more integrated into the global economy both in terms of foreign sales and foreign employment shares than other large firms in the economy. So, it is probable that the 30 largest firms are more vulnerable with respect to turbulences in the global economy. The slowdown in the world economy during the early years of the new millennium, for instance, seems to have hurt the financial performance of the top 30 firms more severely than the financial performance of other large firms.



Notes: The data source is Talouselämä magazine's Top 500 firms' lists.

Figure 4.4: Return on total assets in 1996-2006 (medians)

Do the largest firms grow faster?

Table 4.2 depicts the average annual growth rates of top 30 versus other large firms in terms of production and employment in 1996-2006.⁸ In both samples top 30 firms have grown on average more rapidly during this period both with respect to net sales and total employment than other top 500 firms. The differences are not however statistically significant due to large variance in growth rates among manufacturing firms and are only very weakly significant (at 20 per cent level) with respect to employment in the sample including all sectors.

We have also divided the period into two sub-periods: 1996-2000 and 2000-2006. In both samples, top 30 firms have grown more rapidly in the late 1990s in terms of net sales than other large firms but the difference is not statistically significant even at 20 per cent level due to large variance. In the latter period, there have been no significant differences in the average growth rates with regard to net sales. In terms of employment, on the other hand, weak statistical significances in the difference of the average growth rates can be found in the case of manufacturing firms in 2000-2006; during this period top 30 manufacturing firms have experienced a more intense average growth rate compared to other large manufacturing firms. As we will see in the following analysis, the growth of top 30 firms has principally focused on foreign operations.

⁸ Top 30 firms refer here to firms belonging to the top 30 ranking in 2006. As in the case of the profitability analysis above, it should be stressed that this section is a preliminary descriptive study based on unconditional means.

Observations in regard to growth fit fairly nicely with the overall description of industrial transformation – the late 1990s was a period when large firms were implementing their growth strategies through large and focused international mergers and acquisitions. The beginning of the 21st century, saw again rapid growth of manufacturing off-shoring. Particularly offshoring to Asia grew fast as part of the relatively fast overall growth of the large manufacturing corporations.

Table 4.2: Growth of production and employment in the top 30 vs. other large firms

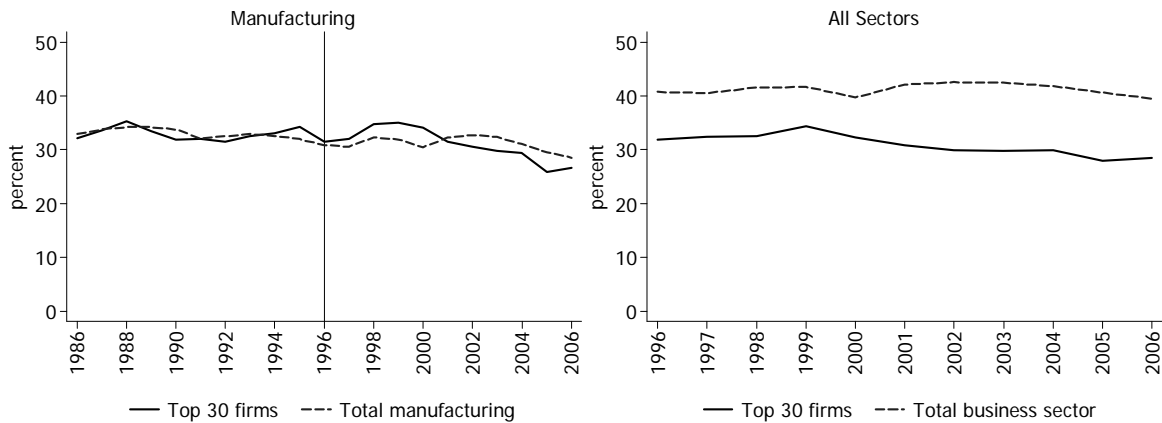
	Largest 30 firms		Other top 500 firms		T-test
	Mean	S.D.	Mean	S.D.	Signif.
<u>Panel A. Manufacturing firms</u>					
Growth of nominal net sales, % p.a.					
1996-2006	8.88	8.76	7.24	6.02	
1996-2000	15.84	20.76	10.07	12.04	
2000-2006	5.21	5.09	5.70	7.91	
Growth of total employment, % p.a.					
1996-2006	4.75	9.70	3.09	6.84	
1996-2000	7.24	14.83	7.52	15.87	
2000-2006	5.31	12.41	1.08	9.13	*
<u>Panel B. All sectors</u>					
Growth of nominal net sales, % p.a.					
1996-2006	9.93	8.91	7.58	5.66	
1996-2000	16.42	21.65	10.51	11.06	
2000-2006	5.42	6.68	6.62	8.14	
Growth of total employment, % p.a.					
1996-2006	5.82	7.34	3.61	6.95	'
1996-2000	8.69	13.59	6.08	13.37	
2000-2006	4.71	10.83	3.36	10.90	

Notes: The data source is Talouselämä magazine's Top 500 firms' lists. The largest 30 firms' group includes companies which were among the top 30 in 2006. Statistical significance: * $p < 0.10$, ' $p < 0.20$.

Specialization

The ratio of value added to value of gross output of industrial firms can be seen as a crude measure of specialization: the decreasing ratio may be an indication that firms in the industry produce a smaller share of total gross output themselves and buy more intermediate products and services from other industries. Figure 4.5 illustrates this ratio among top 30 firms; as a reference group we use industry aggregates. In manufacturing, the ratio in both the top 30

firms group and in total manufacturing has been in the range of 31-35% in the late 1980s and 1990s. Since the millennium the trend has been downward especially among the top 30 firms group in which the ratio has decreased from 34% in 2000 to 27% in 2006. In the all sectors sample, the trend of ratio of value added to output has also been downward among the 30 largest firms in the early 21st century. The downward trend fits again quite nicely to the overall description of industrial transformation – the first years of the 21st century saw a growth of manufacturing outsourcing and off-shoring especially to Asian countries.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide value added and output data); authors' calculations. In the all sectors charts only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996. In the case of top 30 firms, the ratio has been calculated as the firms' total value added to their total net sales. In the cases of total manufacturing and total business sector, the ratios have been calculated from the annual national accounts as a ratio of value added to output of industries.

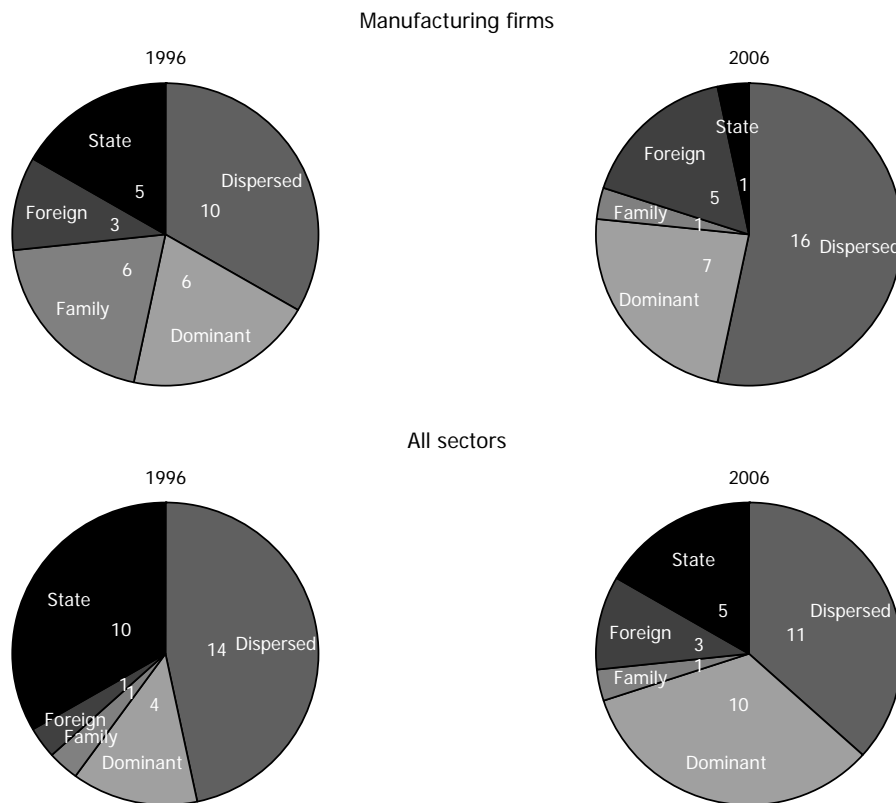
Figure 4.5: The ratio of value added to output, 1986-2006

Major changes in ownership structure

Figure 4.6 illustrates the distribution of owner types in the top 30 firms in 1996 and 2006. We divide ownership into five categories. In the three categories, namely “family”, “foreign”⁹, and “state”, there is a major owner that has over 50% ownership in the firm. The fourth category is called “dominant” which includes those firms in which the ownership share of the largest owner is 20-50%. The fifth category, “dispersed”, is for the firms in which the largest shareholder's stake is less than 20%. We can see from Figure 4.6 that in both samples and both years the largest owner type has been the dispersed one.

⁹ “Foreign” refers to a foreign firm that owns over 50% of the target firm.

However, a long tradition of state-ownership in large companies is still clearly in sight in the first year of observation: there were five companies in the manufacturing sample and ten companies in the sample including other sectors in which the state was the principal owner in 1996. The privatization of state-owned companies has decreased the number of the state-owned firms to one in manufacturing and to five in the all sectors sample in 2006. In manufacturing, it is also interesting to note that the number of family-owned firms has decreased from six to one. In the sample including all sectors, the dominant ownership type has increased notably. Of the foreign-owned firms in manufacturing, two in 1996 and one in 2006 were subsidiaries of the Nordic group. In the dataset including all sectors, in 1996 none and in 2006 two firms were subsidiaries of the Nordic group.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, company reports, and authors' estimates. Ownership types are: Dispersed: the share of the largest owner is less than 20%; dominant: the share of the largest owner is 20-50%; State, family, and foreign: the ownership share of the state, family, or foreign firm is over 50%.

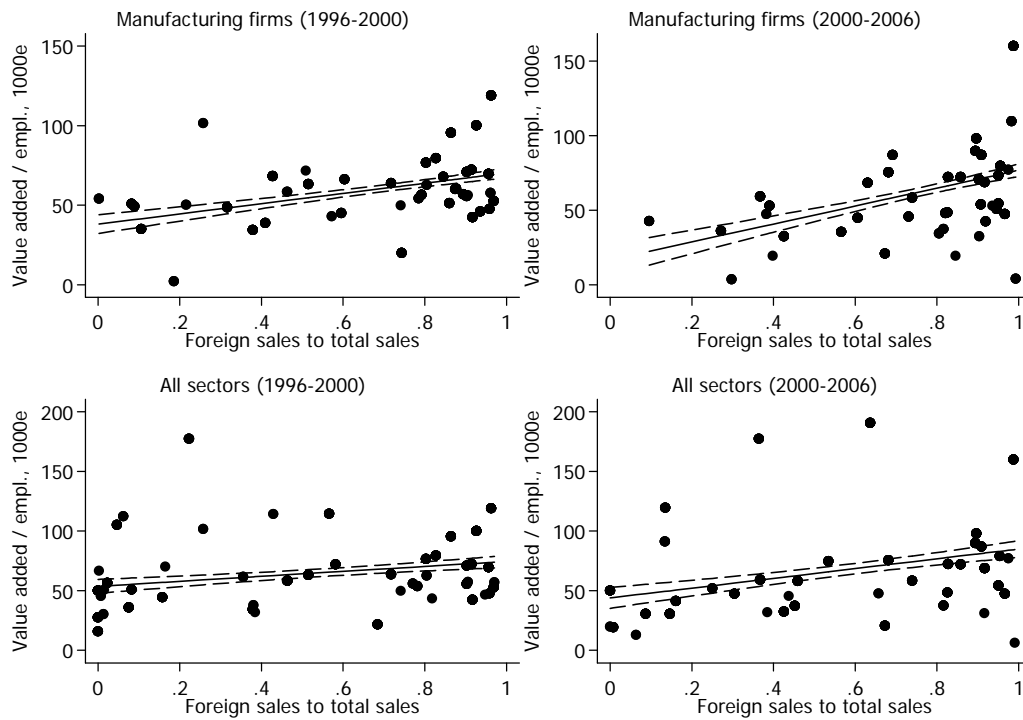
Figure 4.6: The distribution of owners among the 30 largest firms in 1996 and 2006

The firms with dispersed ownership structure are also the largest group of firms in terms of the number of employees in Finland among the 30 largest firms: their share of total number of

employees in Finland among the top 30 firms in manufacturing was 45 per cent in 1996 and 51 per cent in 2006, and in the all sectors sample 42 and 38 per cent, respectively. The share of firms with dominant ownership structure was in manufacturing in 1996 15 per cent and in 2006 as high as 30 per cent. In the sample of all sectors, the shares were nine and 25 per cent, respectively. As the number of state-owned firms has diminished so has their share of employment: the proportion in 1996 in the manufacturing sample was 23 per cent and in the sample including all sectors 44 per cent. In 2006, the percentages were two and 22 per cent, respectively. The same trend is visible in the case of family-owned firms, especially in manufacturing in which the employment proportion of family-owned firms has decreased from nine per cent in 1996 to four per cent in 2006; in the all sectors sample the share was around two per cent in both years. Finally, the portion of foreign-owned firms of the 30 largest firms' total number of employees in Finland has increased in manufacturing from 9 per cent in 1996 to 12 per cent in 2006, and from four to 13 per cent in all sectors sample. In comparison, the share of foreign-owned firms of the total employment in the Finnish business sector was eight per cent in 1996 and 16 per cent in 2006. These percentages suggest that the share of foreign-owned firms in terms of employment in Finland is still slightly lower among the top 30 firms than in the whole business sector. The trend has, however, been strongly upward during the recent decades; in 1975 there were no foreign-owned firms among the top 30 manufacturing firms, and in 1990 there was only one accounting for about two per cent of employment of the top 30 firms' total employment.

Does internationalization increase productivity?

In Figure 4.7 we have drawn scatter diagrams which depict the degree of internationalization (the average share of foreign sales to total sales) and the global labour productivity (the average value added per employee in 2000 euros) among the top 30 firms in the two sub-periods, 1996-2000, and 2000-2006. The charts indicate that there is a slightly stronger relationship between the degree of internationalization and labour productivity in the manufacturing data than in the data including all sectors. In addition, in both datasets the correlation is more evident during the latter period (2000-2006).

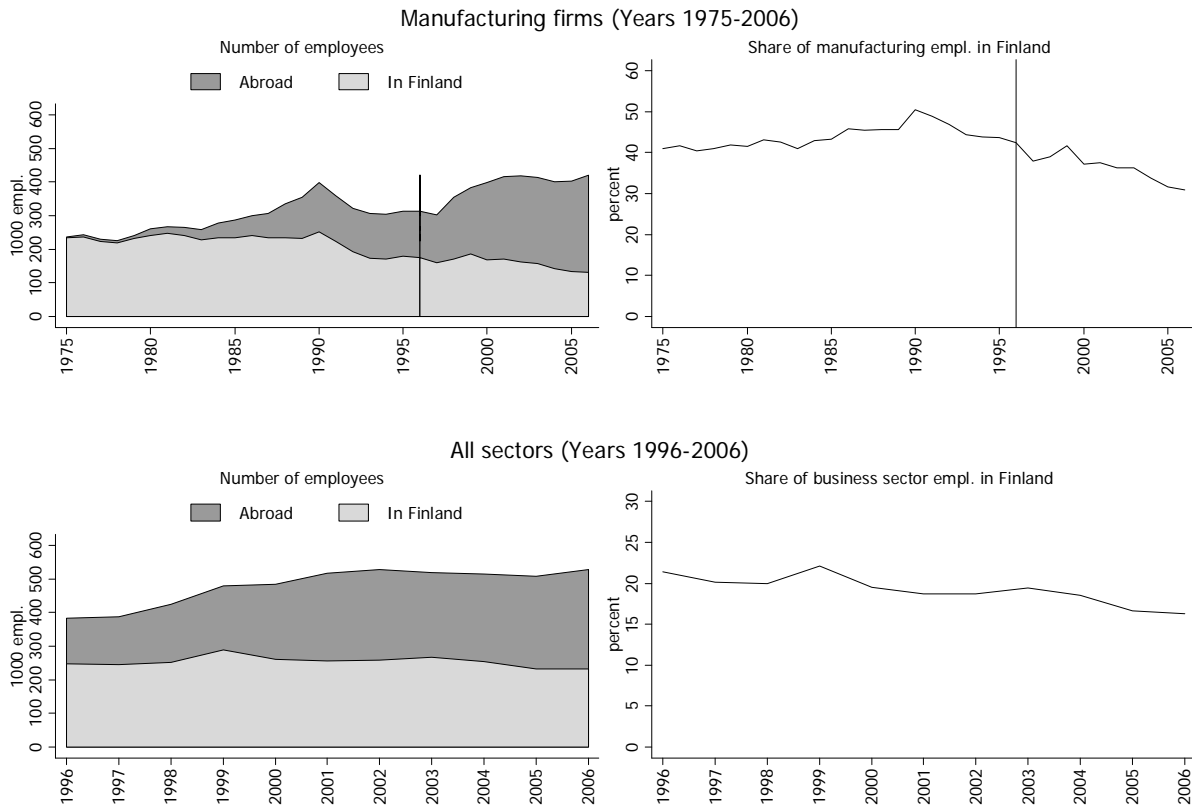


Notes: The data source is Talouselämä magazine's Top 500 firms' lists. The charts include regression lines (solid lines) with 95 per cent confidence intervals (dashed lines) for the simple regression in which global labour productivity has been regressed by the degree of internationalization.

Figure 4.7: The degree of internationalization and global labour productivity

The top 30 firms' share of production and employment

Figure 4.8 illustrates the development of employment in the 30 largest firms and their share of employment in the economy. The internationalization of Finnish manufacturing firms started on a larger scale in the 1980s, intensified somewhat in the late 1980s, and again in the late 1990s. The number of employees in Finland in the 30 largest manufacturing firms has gradually decreased as well as their share of total manufacturing employment: their proportion of the employment in manufacturing was in the 1970s and 1980s about 40%, peaked in 1990 at 48%, and has decreased after the millennium towards 30%. The lower part of Figure 4.8 indicates the same trend in the sample including all sectors: the share of the 30 largest firms of total business sector employment was in the 1990s above 20% and decreased in the early 21st century below that level.

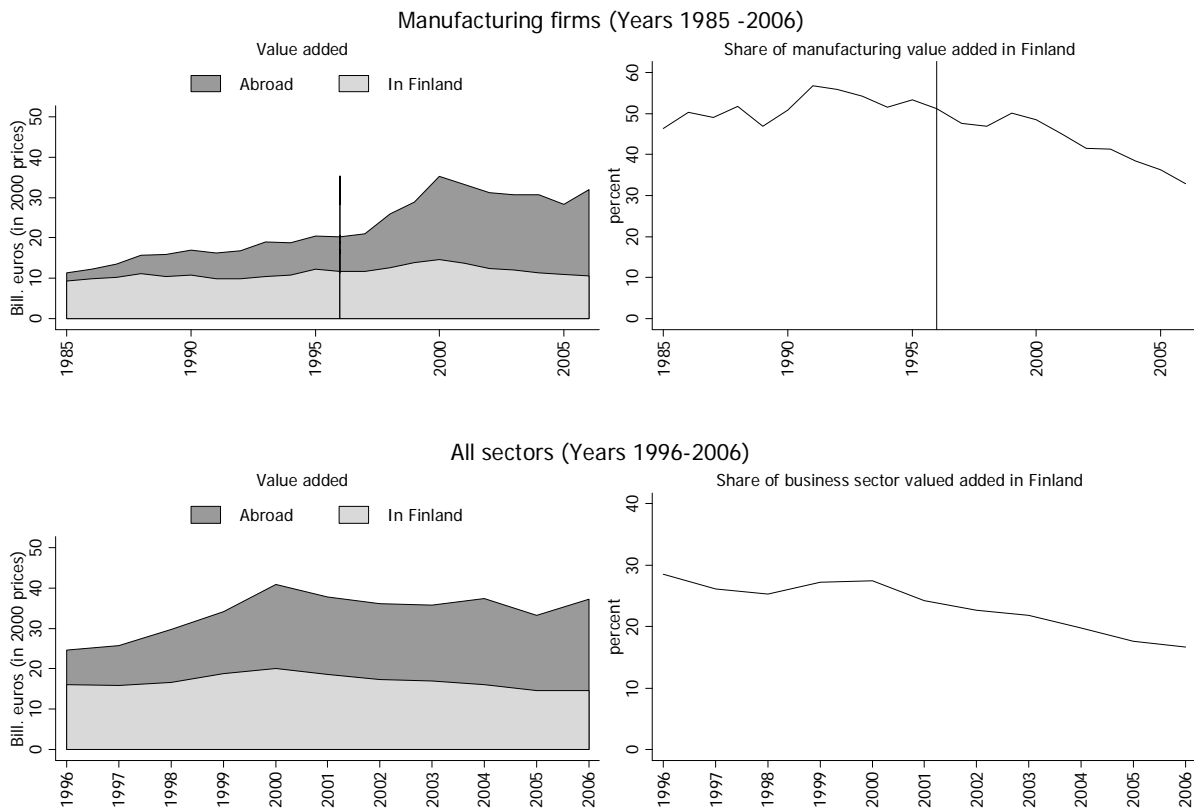


Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide employment data); authors' estimates. In the all sectors charts only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996.

Figure 4.8: Development of employment in the 30 largest firms

In Figure 4.9 we have drawn the development of value added of the 30 largest firms. There are two shortfalls in this figure compared to the employment analysis. First, we have regrettably no direct firm-level data on domestic and foreign components of value added. Instead, we use the domestic and foreign employment shares as an approximation for the firm-level shares of domestic and foreign value added. Although this proxy is quite far from the ideal one, it can be justified on the grounds that labour costs form the major component of value added in many industries. Second, the time span in the case of manufacturing firms is shorter (1985-2006) than in Figure 4.8 due to many missing value added values in the 1970s and early 1980s data.

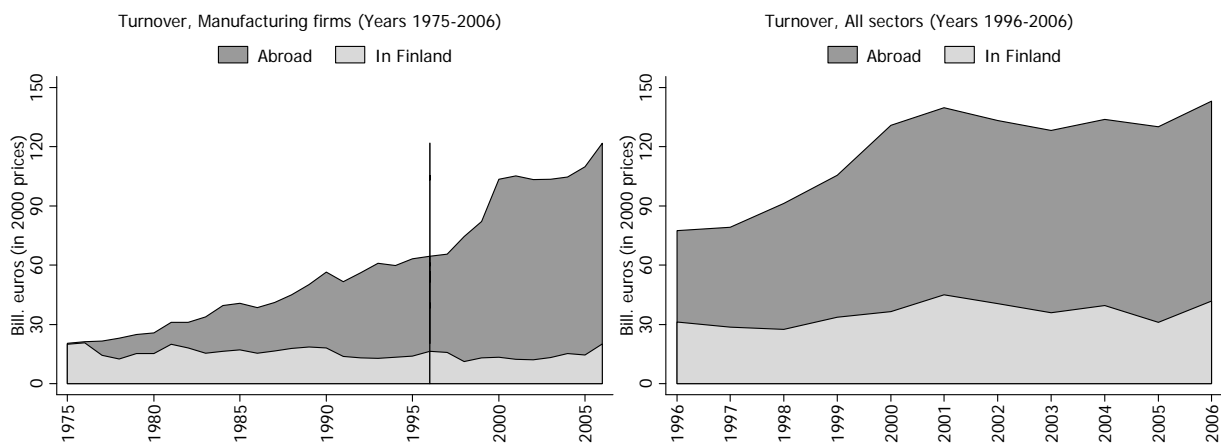
We can see from Figure 4.9 that in the manufacturing sample the foreign component of the 30 largest firms' value added increased quite steadily in the 1980s and early 1990s. In the late 1990s value added from abroad soared both in the manufacturing and all sectors samples, and after the millennium the growth of foreign value added slowed down in both samples. The share of the 30 largest firms of manufacturing production in Finland was in the 1980s and 1990s in the range of 45-50 per cent. This proportion has decreased in the early 21st century to 35-40 per cent. In the sample including all sectors, the share of the 30 largest firms of total business sector value added has fallen from nearly 30% in 1996 to clearly below 20% in 2006.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the former Nordic database on large manufacturing firms, and Statistics Finland (nation-wide production data); authors' estimates. Due to many missing values of value added in the 1970s and early 1980s data, the charts for manufacturing begin from 1985. Total value added has been divided into domestic and foreign shares by using the domestic and foreign employment shares. Value added has been deflated by GDP deflator (2000 = 100). In the all sectors chart only 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' charts indicates the year 1996.

Figure 4.9: Development of value added in the 30 largest firms

Figure 4.10 illustrates the development of domestic and foreign sales of the 30 largest firms. The charts indicate the same kind of trend as in the cases of employment and value added; the internationalization of the firms was rather rapid in the 1980s and especially in the late 1990s, and after the millennium the growth rate of the internationalization slowed down. In addition, from the figure we can see a slight downward trend of sales to domestic markets in the manufacturing firms sample. On the other hand, in the sample including all sectors the overall trend of sales to domestic market seems to be quite flat; the total annual domestic sales of the 30 largest firms were around 30 million euros (in 2000 prices) during the years 1996-2006.

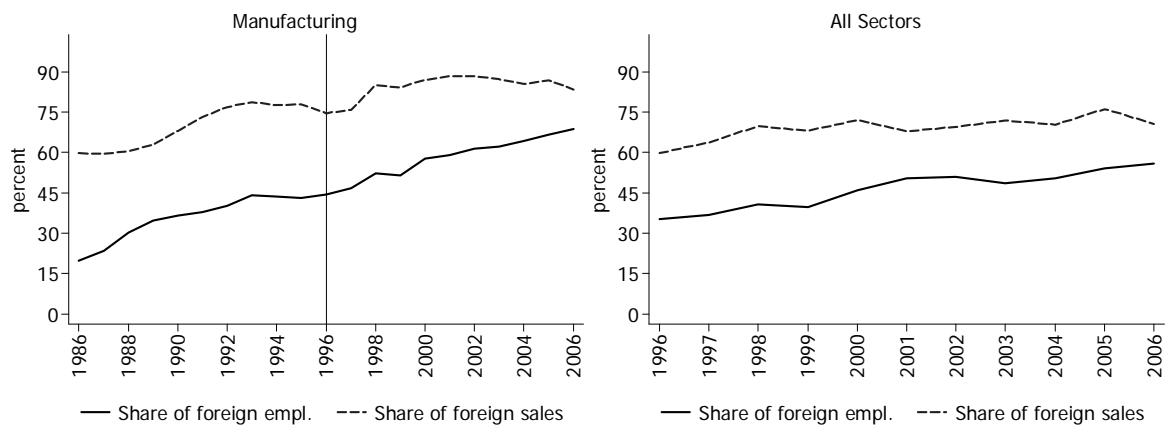


Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, and the former Nordic database on large manufacturing firms; authors' estimates. Turnover values have been deflated by GDP deflator (2000 = 100). In the all sectors chart only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' chart indicates the year 1996.

Figure 4.10: Development of net sales in the 30 largest firms

It is also interesting to compare side by side the development of the shares of foreign sales and foreign employees. Figure 4.11 illustrates these ratios in the case of top 30 firms. We can see that both in the manufacturing and all sectors sample the proportion of foreign sales has been significantly larger than the proportion of foreign employees indicating that domestic production units have satisfied quite a large part of foreign demand. However, we can also see that the trend of the share of foreign employees, especially in manufacturing, has been strongly upwards over the studied period whereas the share of foreign sales increased only until the end of the 1990s; since then the trend of the share of foreign sales has been rather flat. In the manufacturing sample, the ratio of these two shares was 3.0 in 1986, 1.7 in 1996 and 1.2 in 2006 meaning that, for instance, in 2006 the proportion of foreign sales was 20% larger

than the proportion of foreign employment. In the all sectors sample the same ratio was 1.7 in 1996 and 1.3 in 2006. The convergence in the shares implies that in recent years the increasing portion of foreign demand has been satisfied by foreign production units. In addition, the barely steady percentage of foreign sales to total sales during the first years of the 21st century might suggest that at least temporarily a saturation point has been reached in the degree of internationalization of sales of the 30 largest firms.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, and the former Nordic database on large manufacturing firms; authors' estimates. The lines depict the ratio of total number of foreign employees (foreign sales) to total number of all employees (net sales) of the top 30 firms. In the all sectors chart only the 30 largest firms have been included in the calculations if the sample has been larger than 30 (see the main text for definition of the sample). The vertical line in the manufacturing firms' chart indicates the year 1996.

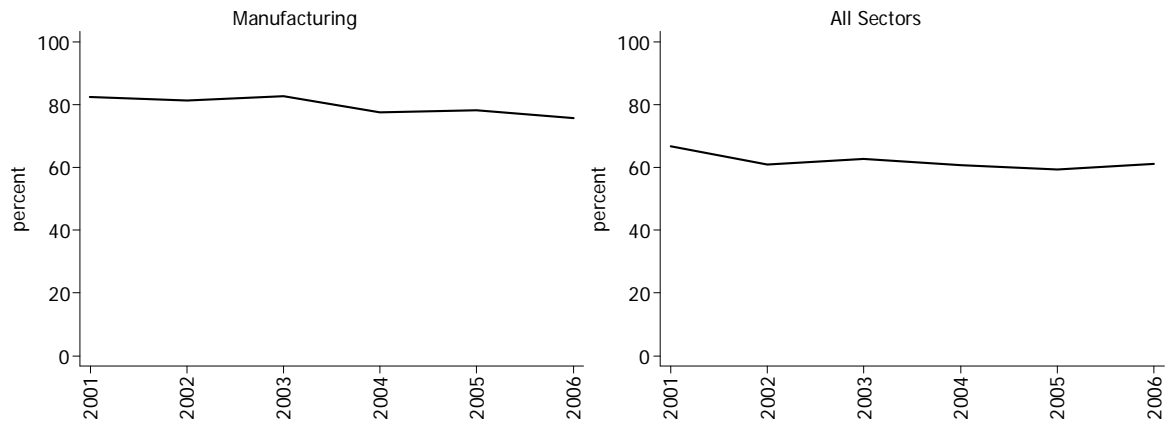
Figure 4.11: The total share of foreign employees and foreign sales of the top 30 firms

Above discussion implies that the significance of the 30 largest firms in the Finnish economy in terms of domestic employment and production has decreased during the recent years. They still, however, have a significant role in the economy, also in many other ways than with respect to domestic employment and production. As an example, in the following we study briefly their role in research and development activities in Finland.

R&D of top 30 firms in relation to business sector R&D

Finland's largest firms have a dominant role in the country's R&D activities. The share of the 30 largest firms' R&D expenditure has however also decreased slightly in recent years both in manufacturing and in the total business sector. As Figure 4.12 illustrates, the proportion of the top 30 firms of R&D carried out in Finland went down from above 82% in 2001 to 76% in 2006. In the total business sector, the share decreased from 66% in 2001 to 61% in 2006.

Especially large manufacturing firms have in recent years increased their R&D in foreign subsidiaries more rapidly than in domestic units which may partly explain the downward trend. It should be emphasized, however, that the top 30 firms' total nominal amount of R&D spending in Finland has increased also in recent years both in the manufacturing and all sectors samples.



Notes: Data sources are Talouselämä magazine's Top 500 firms' lists, firms' annual reports, the Confederation of Finnish Industries (EK), Etlä, and Statistics Finland (nation-wide R&D data); authors' estimations.

Figure 4.12: The estimate of top 30 firms' share of R&D carried out in manufacturing and in total business sector in Finland

Location of foreign subsidiaries

The Orbis database managed by Bureau van Dijk Electronic Publishing enables us to estimate the geographical orientation of top 30 firms' foreign production and other activities. The Orbis database includes quite comprehensive information on location of subsidiaries but unfortunately other relevant data, such as industry classification and employment data, are available only for about 20 per cent of subsidiaries in the case of our top 30 firms. The foreign affiliates with missing data are however likely to be smaller ones than the affiliates with non-missing data and thus we should be able to draw some general view of geographical orientation of foreign operations of top 30 firms with this database. In addition, we have access to data for the latest available year only and thus we are able to analyze no more than one cross-section.

Table 4.3 depicts the location of foreign subsidiaries and employment of top 30 firms in 2006. As we can see from the first columns of the table, in both samples the majority of affiliates are

located in Western Europe and North America. Further, in the manufacturing sample the share of the Nordic countries is 12 per cent, Eastern Asia eight per cent, and the Baltic countries four per cent. In the all sectors sample the proportions are 21, six, and nine per cent, respectively. The next columns of the table show that subsidiaries located in Western Europe and North America also employ the largest share of employees, about 45 per cent in the manufacturing sample and 36 per cent in all sectors sample. In the manufacturing sample the proportion of employment of the Nordic countries is 21 per cent, Baltic countries 11 per cent, and Eastern Asia ten per cent. In the all sectors sample the shares are 33, 11, and eight per cent, respectively. The last columns of the table report the total fraction of employees of the firms working in manufacturing firms in each region. It is worth noting that in the subsidiaries located in Western Europe and North America the total share of employees in manufacturing is remarkably lower than the corresponding share in the subsidiaries located in Eastern Asia. This is a quite intuitive observation as we have seen that in recent years large Finnish firms (as well as their Finnish subcontractors and other partners) have both off-shored in-house and outsourced production quite heavily to low-cost Asian countries.

According to official foreign direct investment statistics maintained by the Bank of Finland, Finnish firms employed a total of nearly 382 000 employees abroad in 2006. Of these, 22 per cent resided in the Nordic countries, 40 per cent in other Western Europe and North America, eight per cent in the Baltic countries, and 13 per cent in Eastern Asia. These shares differ slightly from our data based on the Orbis database; the share of Eastern Asia, for instance, is in our data lower than in official foreign direct investment statistics. However, we are currently unable to work out whether these discrepancies are due to missing data in the Orbis database, differences in data gathering processes, or real differences in geographical orientation between the largest 30 firms and other firms having foreign subsidiaries.

Table 4.3: Location of foreign subsidiaries and employment of top 30 firms in 2006

<u>Panel A. Manufacturing firms</u>					
	Number of firms		Number of employees*		Share of employees in manufacturing (%)*
	Sum	Share (%)	Sum	Share (%)	
Nordic countries	162	11.5	21932	20.8	75.3 [79]
Baltic countries	61	4.3	11571	11.0	71.6 [25]
Western Europe and North America	822	58.2	47538	45.0	64.2 [186]
Eastern Asia	117	8.3	10283	9.7	90.2 [16]
Other countries	251	17.8	14213	13.5	91.2 [34]
Total	1413	100.0	105537	100.0	
<u>Panel B. All sectors</u>					
	Number of firms		Number of employees*		Share of employees in manufacturing (%)*
	Sum	Share (%)	Sum	Share (%)	
Nordic countries	308	20.8	40884	32.7	40.9 [120]
Baltic countries	138	9.3	14151	11.3	34.5 [44]
Western Europe and North America	710	47.9	44765	35.8	57.1 [152]
Eastern Asia	89	6.0	10118	8.1	90.5 [14]
Other countries	238	16.0	15295	12.2	89.3 [37]
Total	1483	100.0	125213	100.0	

Notes: The data source is Bureau van Dijk Electronic Publishing (BvDEP), ORBIS database. The employment and industry classification data have been available only for the largest subsidiaries. The last column in the table reports [in brackets] the number of subsidiaries for which employment and industry classification data have been available. Geographical regions are: Nordic countries (DK, IS, NO, SE), Baltic countries (EE, LT, LV), Western Europe and North America (AT, BE, CA, CH, CY, DE, ES, FR, GB, GR, IE, IT, LU, NL, PT, US), Eastern Asia (CN, HK, ID, IN, JP, KP, KR, LA, LK, MM, MY, NP, PH, PK, SG, TH, TW, VN), Other countries (rest of the world).

Discussion and conclusions

The analysis above shows that a handful of large firms account for a substantial portion of business sector employment and value added in Finland. Moreover, the role of large companies is particularly significant in international activities – especially in foreign direct investment – and in research and development. In the group of the 30 largest firms more than 50% of total employment is abroad, and among the 30 largest manufacturing firms the share is as high as close to 70%. The share of the 30 largest corporations of total Finnish outward FDI stock (measured by foreign employment) is about 80%. Their share of total business sector R&D expenditure is above 60%. The 30 largest manufacturing companies, for their part,

account for over 3/4 of total manufacturing sector R&D.¹⁰ Furthermore, their role in internationalization – mainly outside the European Union – has increased over the past years. From the national economy point of view these firms are in a crucial position. Almost all of them are multinationals, operate in several countries, and make influential decisions on trade and location of production.

Our results show relatively high stability in (size) rankings of the large firms. Especially the largest (top four) have kept their positions quite unchanged over the last ten years of the survey. There have, however, been interesting changes in the rank stability which coincide with the changes in the business environment of large firms. As a consequence of the deepening European integration and liberalization of the global economy in the 1990s, large firms increasingly focused on their core businesses. This led to restructuring in various forms – divestments, and mergers and acquisitions – which is reflected in relatively big changes in rankings in the latter part of the decade. The first decade of the 21st century (since the peak of 2000) has been much less turbulent – the stage of intense restructuring was completed by the turn of millennium.

Among the 30 largest firms there can be found an indication of a positive association between the degree of internationalization and labour productivity. The relation between degree of internationalization and productivity level seems to have strengthened over time as the companies have become even more internationalized and exposed to global competition not only in product markets but also in the markets for production factors.

However, the largest corporations have not been performing better in terms of profitability or productivity compared to the total business sector or the top 500 companies which we used as a reference group. Our analysis shows that the largest manufacturing companies have primarily pursued growth through internationalization and off-shoring. Top 30 manufacturing firms have grown slightly faster than other large manufacturing firms in the early 21st century when global outsourcing and off-shoring accelerated and big manufacturing companies obviously were forerunners in the process. It remains to be seen whether this

¹⁰ In the Finnish case Nokia's role is decisive, it accounts for close to 50% of total business sector R&D in Finland.

internationalization process of recent years will show up as better than average profitability later.

As our data show the role of the largest firms in international activities has increased until recently, but their role in the domestic economy – in terms of value added and employment shares seems to have diminished. Yet, it is an open question, to what extent large firms have reorganized their operations in such a way that they do not directly show up in their own output and employment data. There is a growing amount of evidence that off-shoring, networking, and strategic alliances have become essential parts of larger firms' growth strategies.¹¹ Large firms nurture the emergence and growth of smaller firms in their supplier networks. Hence, their overall influence might be much larger than indicated by the direct employment shares.

The ownership structure of the large corporations has changed considerably since the mid-1990s. The role of the state as an owner has diminished, and foreign ownership, both in the form of direct and portfolio ownership has increased. In the group of large manufacturing companies, dispersed ownership has become the dominant type of ownership. Domestic banks, insurance companies, and other big domestic institutional owners gave up their stake as dominant owners as a consequence of the financial market development during the 1990s. The financial system as a whole moved from a bank-based towards a market-based system where markets play a key role in allocating capital and controlling the management.¹² From the public policy point of view the financial development and changes in ownership structure mean that the influence of policy is much less direct. The role of the state as an owner has dramatically decreased and the possibility to affect industrial firms through monetary policies is insignificant compared to the early 1990s.

¹¹ See, e.g., Palmberg and Pajarinen (2005).

¹² For a comprehensive overview, see Hyytinen and Pajarinen (2003).

Appendix: The 30 largest firms in Finland in 2006

A. Manufacturing firms

Rank	Firm name	Number of employees
1	Nokia	65300
2	Stora Enso	45600
3	UPM-Kymmene	31000
4	Metsäliitto Osuuskunta	28800
5	Kone	28400
6	Metso	23400
7	Elcoteq SE	16700
8	SanomaWSOY	15700
9	Huhtamäki	14700
10	Wärtsilä	13300
11	Karl Fazer	13100
12	Rautaruukki	13100
13	Kemira	9190
14	Outokumpu	8510
15	Cargotec	8030
16	Salcomp	7570
17	Sanitec	7390
18	Perlos	7320
19	Konecranes	6860
20	Amer Sports	6790
21	ABB	6290
22	Luvata International	6250
23	Atria	5740
24	Ahlstrom	5690
25	Consolis	5510
26	HK-Scan	4420
27	Uponor	4260
28	Valio	4170
29	PKC Group	4010
30	Rapala VMC	3990

B. All sectors

Rank	Firm name	Number of employees
1	Nokia	65300
2	Stora Enso	45600
3	UPM-Kymmene	31000
4	Metsäliitto Osuuskunta	28800
5	Kone	28400
6	Itella	25300
7	Kesko	23800
8	Metso	23400
9	YIT-Yhtymä	21800
10	Elcoteq SE	16700
11	SanomaWSOY	15700
12	Huhtamäki	14700
13	TietoEnator	14400
14	ISS Palvelut	14200
15	Wärtsilä	13300
16	Karl Fazer	13100
17	Rautaruukki	13100
18	VR-Yhtymä	12700
19	Sampo Konserni	11700
20	Stockmann	10100
21	Nordea Pankki Suomi	9840
22	Finnair	9600
23	Kemira	9190
24	Fortum	8910
25	Outokumpu	8510
26	Lemminkäinen	8420
27	Cargotec	8030
28	SOL Palvelut	7620
29	Salcomp	7570
30	Sanitec	7390

Chapter 5

Large corporations in the Norwegian economy

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Introduction

The Norwegian economy has experienced significant growth over the last 20-30 years. GDP per capita rose in the 1990s and up to 2006 by an annual average of 2.8 per cent. In the same period only Ireland experienced higher growth in Western Europe.

The economic development of Norway has, of course, been influenced by the fact that Norway has become a major producer and exporter of crude oil and natural gas. However, what is more important for the long-term development of the Norwegian economy is that productivity growth has been kept at an internationally high level also in other sectors than oil and gas.

There are many factors underlying the performance of an economy at the aggregate level. The industries, in which the economy is specialized, are obviously of importance. The industry structure of Norway has always differed somewhat from the average of the smaller OECD countries in the sense that the role of manufacturing has been of relatively less importance, both in the exposed sector of the economy and with regard to domestic employment. Services, in particular relating to international shipping, made up for 50 per cent and more of Norwegian exports in the post WW2 period, and since the mid-1970s oil and natural gas have gained the dominant position. Even though the upstream oil and gas industry only employs around 1 per cent of Norwegian labour, it currently makes up for roughly 25 per cent of GDP, 33 per cent of state revenues and 50 per cent of total exports.

The share of manufacturing has always been low in the Norwegian economy when compared with other industrialized countries. It has also declined over the last 30-35 years as in most

industrialized countries. When measured by employment, manufacturing currently makes up 11% of the Norwegian economy.

However, underneath the industry structure it is the underlying dynamics at the firm level that are of crucial importance for economic development. Technological progress and innovation offers different opportunities for established companies and newcomers. Companies continuously enter and exit the scene. They merge and restructure industrial activities, expand some, and lay off others. Thus, at the firm level there will be a heterogeneous and turbulent growth pattern, which should be regarded as a prerequisite for strong and stable growth at the aggregate level of the economy.

We have chosen to focus on the 30 largest corporations to capture and illustrate industrial dynamics at the firm level of the economy. The largest were chosen because they encompass more economic activities than smaller ones, while the number of 30 corporations was chosen because it is sufficient to capture a significant part of economic activities while studying a rather limited number of corporations.

In a similar study 20 years ago we also chose to concentrate on manufacturing corporations, as manufacturing was considered the engine of industrialized economies. In this study we update findings from our earlier studies. However, as the share of manufacturing declines and other sectors of the economy increasingly experience the forces of globalization, we have also included the largest corporations in the private sector of the economy. The idea is to elaborate on how globalization and technological change, in particular the digital revolution, may affect the structure and dynamics of major firms in the economy.

After a brief description of the data, we start out by identifying the 30 largest manufacturing and private sector corporations in order to present some structural features such as how large they are, in what industries they operate and ownership characteristics.

The composition of the group of companies that are listed among the 30 largest varies from one year to another. This may illustrate one aspect of importance with regard to the industrial dynamics among firms. Do the corporations that make up the largest change over time, or do the largest companies one year tend to stay among the largest for many years? We address

this issue before we go on to elaborate on how the business operations of the largest firms change over time, and whether their performance differ from the performance of smaller firms. Finally, this chapter is summarized in a discussion of the role of the largest corporations in the Norwegian economy.

Data

We have made use of information from AS Økonomisk Litteratur to identify the largest firms in Norway measured by employment. Information on the largest firms has been published annually since the 1960s and is now available on www.norgesstorstebedrifter.no.

From previous studies we have data on the 30 largest manufacturing corporations with regard to employment for every year from 1975 to 1993. These data cover information from annual reports on turnover, employment, assets, equity, value added and profit, in addition to information collected directly from the corporations themselves covering the separation of domestic and foreign operations with regard to sales and employment, as well as data on to what extent they engage in R&D.

The aim of this study has been to collect similar data for the 30 largest manufacturing corporations, and for the 30 largest corporations in the private sector, covering the years 1996-2006. The coverage of data that have been collected from annual reports is good. It has, however, been harder to collect data directly from the corporations covering every year in the previous ten-year period. This is partly because company structures change and relevant information is really only easily available with regard to the current structure of the corporations. We also observe a change with regard to the role of the headquarter of a corporation; the headquarter no longer seems to have the same detailed information about its many entities at the corporate level as before. Thus, we have concentrated our efforts on providing reliable data for the beginning and end of this period, i.e. for 1996 and 2006.

We have included all operations subject to the legal control of corporations registered in Norway regardless of whether the entity is foreign-owned or not. If foreign owned, we only include operations in Norway and foreign operations which are subject to majority ownership

control of the Norwegian entity; the operations of the foreign parent company or sister companies abroad are, of course, not included.

Structural features

Size

The largest Norwegian corporations are not large by international standards. This particularly holds for the largest manufacturing corporations. Table 5.1 lists the ten largest corporations in Norway in 2006, while the complete list of the 30 largest is presented in an appendix.

Table 5.1: NORWAY: The largest corporations by employment, 2006. Manufacturing and all private sector industries

MANUFACTURING		ALL INDUSTRIES	
Name	Employment	Name	Employment
Aker	46 255	Aker	46 255
Norsk Hydro	33 605	Telenor	35 600
Orkla	28 664	Norsk Hydro	33 605
Norske Skogindustrier	9 372	Orkla	28 664
Yara International	7 060	Statoil	25 435
Nortura	5 489	Wilh. Wilhelmsen	13 500
Jotun	5 331	DnB NOR	11 993
Tine	5 025	Norske Skogindustrier	9 372
Alpharma	4 500	Norges-gruppen	9 255
Umoe	3 867	Schibsted	8.581
Average size # 1-10	14 917	Average size # 1-10	22 226
Average size # 11-30	2 206	Average size # 11-30	4 755
Average size 30 largest	6 328	Average size 30 largest	10 584

It is evident that only three manufacturing corporations had more than 10,000 employees in their worldwide operations in 2006. The mean employment for the 30 largest companies was just above 6,300. However, there are huge size differences. Average employment for the ten largest companies was close to 15,000, or almost seven times the average employment of the next 20 on the list (nos 11-30), which was just above 2,200.

The largest corporations in the private sector are on the average somewhat bigger. Actually, only four manufacturing corporations qualify to be among the ten largest corporations when the whole private sector is considered; and less than half, i.e. 14, make the Top 30 in the private sector. This reflects the relatively low level of manufacturing in the Norwegian economy.

When considering the size of the largest private sector corporations, there are seven with more than 10,000 employees in their worldwide operations. The ten largest are on the average 50% larger than the ten largest manufacturing corporations, while the next 20 on the list are more than twice as large as nos 11-30 among the largest manufacturing corporations.

Industry

The largest manufacturing corporations

In Table 5.2 the 30 largest manufacturing corporations are listed by industry according to NACE Rev. 1.1. In 2006, in particular mechanical engineering, and also to some extent food production, stand out as the industries in which the largest corporations most frequently have their main industrial activity. Compared to 1996 there has been a significant increase in the share of the largest corporations that operate in both these industries. On the other hand, the number of corporations that operate in industries like pulp and paper, chemicals and basic metals, has been significantly reduced during the same period.

Table 5.2: NORWAY: The 30 largest manufacturing corporations by industry, 1996 and 2006. NACE Rev. 1.1

	1996	2006
Food and beverages (15)	3	5
Tobacco and apparel (16-19)	1	
Pulp, paper and wood products (20, 21)	4	3
Chemicals, pharmaceuticals and plastic products (23-25)	4	3
Basic metals, metal and non-metallic mineral products (26-28)	5	2
Mechanical engineering (29, 34, 35)	9	13
Electrical engineering (30-33)	4	2
Other manufacturing (36, 37)		2

The largest private sector corporations

It is already noted that corporations with industrial activities in other industries than manufacturing form the majority of the 30 largest corporations in the private sector of the Norwegian economy. The number of non-manufacturing corporations on the Top 30 private sector list was also high in 1996.

It is evident from Table 5.3 that the largest private sector corporations are scattered across different industries. Compared to 1996, the number of large corporations in Financial intermediation (banks and insurance) is much lower in 2006. This is also the case for large corporations in international shipping (transport), while the number of large corporations in oil related services, which have actually originated from shipping, has increased.

Table 5.3: NORWAY: The 30 largest private sector corporations by industry, 1996 and 2006. NACE Rev 1.1

	1996	2006
Oil, natural gas and related services (11)	1	4
Food and beverages (15)	3	4
Pulp, paper and wood products (20, 21)	1	2
Chemicals, pharmaceuticals and plastic products (23-25)	3	3
Basic metals, metal and non-metallic mineral products (26-28)	2	1
Mechanical engineering (29, 34, 35)	5	4
Electrical engineering (30-33)	1	
Publishing (22)		1
Construction (45)	1	2
Trade (50-52)	2	3
Transport (60-64,ex. 642)	4	2
Financial intermediation (65-67)	5	1
Telecom, software (642, 72)	1	2
Other business activities (74)	1	1

Ownership

The largest manufacturing corporations

Foreign investors have played an important role in the history of industrialization in Norway. Several of the largest manufacturing enterprises in Norway have traditionally been subsidiaries of foreign companies. At times this has been an important part of the political discourse, and in some cases efforts have been made to bring these industrial activities under domestic ownership control. Still, the Norwegian economy has been quite open to foreign investors. Table 5.4 shows that as many as seven of the 30 largest manufacturing corporations in Norway were part of a foreign controlled multinational in 2006, even though none of these are in the Top 10.

For different reasons, of which the WW2 settlement and efforts to bring foreign owned companies under domestic ownership control are of the more important, the state has engaged itself as a direct owner in manufacturing in Norway. As late as 1985, the state was the majority owner of several of the larger manufacturing corporations. Since then, however, privatization has become an issue, and the state's ownership position has been reduced. In 2006, the state was no longer the majority owner of any of the 30 largest manufacturing corporations in Norway, but it was still the dominant owner (20-49%) of three.

Table 5.4: NORWAY: The 30 largest manufacturing corporations by ownership categories, 1975-2006. Number of firms

	1975		1985		1996		2006	
	10 largest	30 largest	10 largest	30 largest	10 largest	30 largest	10 largest	30 largest
State majority	3	6	4	5	1	2	0	0
Foreign majority	2	4	0	3	1	5	0	7
Family majority	0	5	0	4	1	6	1	5
Dominant owner	2	7	3	9	4	11	5	10
<i>State</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>2</i>	<i>3</i>
Dispersed	3	8	3	9	3	6	4	8

Families still hold majority positions in five of the 30 largest manufacturing corporations, and families are the dominant owners in several of them. Throughout the 1975-2006 period less than one third of the largest corporations were characterized by dispersed ownership.

The largest private sector corporations

Looking at state ownership of the largest corporations in the private sector in 2006, some additional explanations as to their origin may be in order. The state is the majority owner of Statoil (70.9 per cent in 2006). Statoil, however, was established as a 100 per cent state owned national oil company in 1972, as it was expected that oil and gas would become a dominant industry in the Norwegian economy, and because this industry was dominated by giant global players, referred to as the seven sisters (cf. Sampson, 1975). For another major state owned company, Telenor (54.0 per cent), history plays an important role as this is the company that

has commercialized the operations of the old telephone monopoly. As shown in Table 5.5, the state is also the dominant owner in three of the 30 largest private sector corporations. Thus, the state plays a noticeable role as owner in the private sector of the Norwegian economy, too. However, when comparing the ownership structure of the 30 largest companies in 2006 with that of ten years earlier, the ownership position of the state has become less pronounced.

Table 5.5: NORWAY: The 30 largest corporations in the private sector by ownership categories, 1996 and 2006. Number of firms

	1996		2006	
	10 largest	30 largest	10 largest	30 largest
State majority	3	6	2	2
Foreign majority	1	3	0	4
Family majority	2	6	2	6
Dominant owner	2	7	4	12
<i>State</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>
Dispersed	2	8	2	6

Further it is clear that foreign ownership and family ownership also play an important role among the largest private sector corporations. In particular families are also found within the group of corporations with one dominant owner. The number of corporations with dispersed ownership is rather low; it was only six in 2006.

Turbulence in the ranking of the largest corporations

Top 10 in 1996 and 2006

When comparing the ten largest corporations in 1996, as shown in Table 5.6, with the ten largest in 2006 (Table 5.1), it is evident that the situation in Norway does not resemble one of high stability in the ranking of the largest corporations. Only five of the ten largest manufacturing corporations in 1996 make the Top 10 list in 2006, while for the largest private sector corporations this holds for six.

We shall return to the issue of growth in industrial activities within the largest corporations later. Nevertheless, when comparing Table 5.6 with Table 5.1, it becomes clear that the average size of the largest manufacturing corporations, measured by number of employees, has declined since 1996. The largest companies in the private sector, however, have become slightly larger.

Table 5.6: NORWAY: The largest corporations by employment, 1996. Manufacturing and all industries

MANUFACTURING		ALL INDUSTRIES	
Name	Employment	Name	Employment
Kværner	71 166	Kværner	71 166
Norsk Hydro	35 400	Norsk Hydro	35 400
Orkla	18 277	Orkla	18 277
Aker RGI	16 936	Telenor	18 133
ABB	12 398	Aker RGI	16 936
Dyno	7 706	Statoil	15 171
Norske Skogindustrier	5 965	ABB	12 398
Rieber & Søn	5 754	Hakon-gruppen	12 000
Nycomed	5 614	Dyno	7 706
Elkem	5 300	Wilh. Wilhelmsen	7 072
Average size # 1-10	18 451	Average size # 1-10	21 424
Average size # 11-30	2 397	Average size # 11-30	4 360
Average size 30 largest	7 748	Average size 30 largest	10 048

Restructuring among the largest manufacturing corporations since 1975

It is quite evident from Table 5.7 that there has been a significant turnover among the manufacturing corporations that constitute the largest from one year to another. We have looked at the Top 10 list every fifth year or so since 1975. The ten largest companies in 1975 are identified by the numbers 1-10 according to their rank, while new companies are numbered from 11 upwards as they enter the Top 10 list.

Over the 30-year period from 1975 there are 29 different corporations that have been listed among the Top 10. It is a curiosity that the two largest corporations in 1975 were also the two largest in 2006. They are, however, the only ones from the Top 10 of 1975 that still remained on the list in 2006.

The level of turnover among the ten largest companies is significant, and has been rather high during the last two decades: For the ten-year period 1975-1985 there were three new corporations that made the Top 10 ranking. For the following ten years, 1985-1996, there were eight new entries, and there were also eight new ones for the last ten-year period, 1996-2006.

This corresponds with the findings in Heum and Ylä-Anttila (1993) where the annual exit rate from the Top 30 list of the largest manufacturing corporations in Norway was twice as high in the years 1985-1990 compared to the period 1975-1984. This higher exit rate seems to have been maintained during the 1990s and in this century.

Table 5.7: NORWAY: The ten largest manufacturing corporations, 1975-2006. Rank position when entering Top 10

1975	1980	1985	1990	1996	2000	2006
1	2	2	2	6	2	1
2	1	13	10	2	6	2
3	4	4	6	17	17	17
4	5	6	1	1	1	16
5	6	5	14	19	19	24
6	3	3	4	15	16	25
7	11	1	15	16	22	26
8	12	11	16	20	20	27
9	10	7	17	21	4	28
10	7	12	18	4	23	29

Restructuring among the largest corporations 1996-2006

Altogether there were 60 different manufacturing corporations that were registered among the 30 largest in at least one year in the 1996-2006 period. Even more, i.e. 68, were needed to complete the list of the 30 largest companies in the private sector. This is shown in Table 5.8.

Table 5.8: NORWAY: The largest corporations by the number of years they were listed among the 30 largest, 1996-2006

# of listings	Manufacturing	All industries
1	14	16
2	5	9
3	4	5
4	6	7
5	4	5
6	4	6
7	1	2
8	3	3
9	6	4
10	2	3
11	11	8
Number of corporations	60	68

This table also shows how many of the eleven years, 1996-2006, the different corporations made the Top 30 list. In manufacturing 11 of the corporations were among the 30 largest every year, while 14 made the list only once. For the whole private sector eight corporations made the Top 30 list every year, while 16 only made it once.

The turn-over rate is quite substantial among the 30 largest corporations. It is somewhat higher for the largest corporations in the whole private sector compared to the largest manufacturing corporations.

Growth and internationalization

Are the largest companies becoming larger?

The largest manufacturing corporations

When we studied the largest manufacturing corporations from the mid-1970s to the mid-1990s, a very clear picture emerged: The largest companies increasingly conducted a larger volume of industrial activities (Heum et.al., 1998). As Table 5.9 reveals, total employment in the 30 largest industrial corporations worldwide, doubled from 1975 to 1996, and it was the largest of the largest that were becoming larger. Worldwide employment within the Top 10 group almost tripled in the same period.

Table 5.9: NORWAY: Total worldwide employment in the 10 and 30 largest manufacturing corporations, 1975-2006. Numbers in 1000

	1975	1980	1985	1990	1996	2000	2006
10 largest	69	76	86	112	184	165	149
11-30 largest	45	47	49	43	48	39	44
30 largest	114	123	135	155	232	204	193

However, when considering what has happened after the mid-1990s, the volume of industrial activities that are conducted within the largest manufacturing corporations, as measured by employment, has decreased. This reduction has been most pronounced in the group of the ten largest companies. This can to a great extent be explained by the development in one corporation, namely Kværner. In the early 1990s Kværner acquired the much larger UK company Trafalgar House, with high gearing. While Kværner had roughly 12,700 employees in 1990, the corporation had more than 71,000 in 1996. Kværner then ran into huge problems and had to divest. By the year 2000 the number of employees in Kværner had been reduced to 34,000. Problems continued, and what was left of Kværner was finally acquired by Aker. By 2006, the Kværner corporation no longer existed as an independent corporation. Thus, disregarding Kvaerner, the aggregate growth in industrial activities, as measured by

employment, has been quite steady among the largest manufacturing corporations also after 1990.

There are, however, more general industrial trends which may influence the size of companies. The ideas of lean production and concentration on core business activities have initiated processes in some corporations to separate unrelated activities into new independent corporations, and also to merge parts of their business with others. This will also have an effect on the volume of industrial activities within the group of the largest corporations, even though the net aggregate impact cannot be predicted.

The largest private sector corporations

Of course, the development among the ten largest manufacturing corporations also influences the volume of industrial activities that are registered to take place within the largest corporations in the private sector of the economy. However, Table 5.10 shows that these trends among the largest of the large in manufacturing, have been counteracted by more general growth in the operations of the largest private sector corporations. The net impact is a five per cent growth in total employment for the 30 largest corporations in Norway in 2006 compared to 1996. However, bearing in mind the importance of Kværner in these figures, it is rather evident that there has been significant growth in the industrial activities conducted by the largest non-manufacturing corporations in general.

Table 5.10: NORWAY: Employment in the 10 and 30 largest corporations in the private sector, 1996 and 2006. (Numbers in 1000)

	1996	2006
10 largest	214	222
11-30 largest	87	95
30 largest	301	317

Internationalization of industrial activities

The largest manufacturing corporations

Exports and imports have always played an important role in the Norwegian economy. As for many small industrialized countries, the value of exports and of imports has been close to 50 per cent of GDP for decades. Thus, it is no surprise that also the major Norwegian corporations are engaged in sales abroad. Table 5.11 confirms this. In 1975, foreign sales of the 30 largest manufacturing corporations almost equaled domestic sales.

Table 5.11: NORWAY: Share of foreign sales and foreign employment for the 30 largest manufacturing corporations, 1975-2006. Per cent

	1975	1980	1985	1990	1996	2000	2006
Foreign sales, % of total sales	48	54	59	64	74	78	76
Employment abroad, % of employees	6	9	14	34	57	59	61

At that time, these sales were almost exclusively traditional exports. With less than ten per cent of the employees in foreign entities of these corporations, hardly any of the largest manufacturing corporations were involved in production abroad.

Since 1975 the way that the largest manufacturing corporations in Norway operate internationally, has significantly changed. They are increasingly involved in international operations as multinational corporations. The share of foreign employment within these firms has increased tremendously over the last 20 years, and at a much higher rate than foreign sales. Today the 30 largest manufacturing corporations in Norway employ more people abroad than at home.

Thus, on the average the 30 largest manufacturing corporations bear the characteristics of global actors. To the extent that the distribution of employment reflects the distribution of production, more than 60 per cent of their production takes place outside Norway, while more than 75 per cent of their sales revenues are generated in foreign markets. The corporations no longer operate internationally primarily to serve international markets with exports from

Norway. They increasingly engage in production and sourcing of components and talent abroad.

Of course, each of the 30 largest manufacturing corporations may differ significantly from this average. Table 5.12 confirms, however, the trends that are envisaged by average figures: There has been a broad based internationalization of the business activities among the largest manufacturing corporations. Whereas one third of the 30 largest manufacturing companies in 1975 had more than 50 per cent of their sales abroad, this was the case for more than two thirds in 2006. And even more strikingly; the largest corporations are increasingly conducting production abroad. In 1975, all of the 30 largest had the majority of their employees in entities located in Norway; in 2006, the majority had more employees in entities located abroad than in Norway.

From Table 5.12 we may also raise the question of whether for the last ten years an opposite trend has also been taking place. It is evident that the trend of internationalization was quite uniform among the largest manufacturing corporations until the mid-1990s. The number of corporations among the 30 largest that were solely oriented towards serving domestic demand, as well as the number of corporations that located all of their production to Norway, was steadily decreasing. However, during the 1996-2006 period the number of corporations with more than 90 per cent of their sales to Norway, and the number of corporations with more than 90 per cent of their employees in Norway, have both increased. Some of the foreign owned corporations are represented in this group, as well as some domestically owned. Among the latter we find corporations in food production such as meat and dairy products, which have originated from the reorganization of cooperatives among farmers to meet the challenges of internationalization in the domestic market. Their domestic market position is to a large extent protected as Norway is not a part of the single European market when it comes to agricultural products. The regional farmer-based cooperatives have decided to merge in order to benefit from scale economies. Thus, they have become large by Norwegian standards. However, having no comparative advantage internationally, their industrial operations are domestically oriented and domestically based.

Table 5.12: NORWAY: The 30 largest manufacturing corporations by their share of foreign sales and foreign employment, 1980-2006. Number of corporations

	1980	1990	1996	2000	2006
Foreign sales, % of total sales					
0-10%	4	2	1	3	4
11-30%	5	6	2	2	1
31-50%	10	4	2	1	3
51%-	11	18	25	24	22
Employment abroad, % of employees					
0-10%					
11-30%	22	11	6	6	9
31-50%	6	5	5	5	2
51%-	2	8	8	2	3
	0	6	11	17	16

The largest private sector corporations

The international orientation of the largest private sector corporations is on the average a little less pronounced than for the average of the largest manufacturing corporations. This is evident when comparing the data in Table 5.13 with those in Table 5.11. The trend of increasing internationalization is, however, quite clear also for the largest private sector corporations.

Table 5.13: NORWAY: Share of foreign sales and foreign employment for the 30 largest corporations in the private sector, 1996 and 2006. Per cent

	1996	2006
Share of foreign sales, % of total sales	58	72
Share of foreign employment, % of employees	48	57

It is also evident from Table 5.14 that the largest private sector corporations by and large reveal the average trend of growing internationalization. Compared to 1996 there were fewer

corporations in 2006 that were mainly oriented towards the Norwegian market. There were also fewer of the largest firms that had almost all of their value generating activities in Norway. Similarly, the number of corporations which had more than half of their sales abroad, as well as the corporations with the majority of their employees in entities located outside Norway had increased.

Table 5.14: NORWAY: The 30 largest corporations in the private sector by their share of foreign sales and foreign employment, 1996 and 2006. Number of corporations

	1996	2006
Foreign sales, % of total sales		
0-10%	9	6
11-30%	2	3
31-50%	2	3
51%-	17	18
Employment abroad, % of employees		
0-10%	11	8
11-30%	4	3
31-50%	5	4
51%-	10	15

As for the largest manufacturing corporations, there are mainly corporations in trade, foreign and domestically owned, in the financial sector and food production that are mainly oriented towards the Norwegian market, and which are mainly industrially based in Norway.

Location of industrial activities

The largest manufacturing corporations

We have already concluded that the industrial activities that are conducted within the group of the largest manufacturing corporations have grown significantly since 1975, and that all employment growth that is recorded may be ascribed to the operations of the ten largest firms.

Table 5.15 shows the growth pattern of the largest manufacturing corporations when their employment is split between their entities located in Norway and abroad.

Table 5.15: NORWAY: Domestic and foreign employment in the 10 and 30 largest manufacturing corporations, 1975-2006. 1000 employees

	1975	1980	1985	1990	1996	2000	2006
10 largest	69	76	86	112	184	165	149
<i>Domestic</i>	64	68	64	70	68	65	52
<i>Foreign</i>	5	8	12	42	116	100	97
11-30 largest	45	47	49	43	48	39	44
<i>Domestic</i>	43	43	42	33	32	19	24
<i>Foreign</i>	2	4	7	10	16	20	20
30 largest	114	123	135	155	232	204	193
<i>Domestic</i>	107	111	106	103	100	84	76
<i>Foreign</i>	7	12	19	52	132	120	117

Until the mid 1990s the rise in employment in the largest corporations was mainly caused by growth in their foreign operations. Domestic employment was kept more or less at the same level for the 30 largest firms. However, the group of the ten largest slightly increased their employment in entities located in Norway, while it was reduced for those lower down on the Top 30 list.

In the years 1996-2006 the total number of employees within the group of the 30 largest manufacturing corporations decreased, mainly caused by changes in the group of Top 10 corporations. Employment in domestic entities of these corporations was reduced by almost 25 per cent. Foreign employment also decreased, however, at a slower rate.

As already mentioned, the aggregate growth of the largest manufacturing corporations in this period, was strongly influenced by the development in one of these corporations (Kvaerner). Excluding Kvaerner would still not change the fact that domestic employment within the group of the largest manufacturing corporations has been declining. It would, however,

change the impression that also the foreign employment in the largest manufacturing corporations in Norway has been reduced, as the foreign employment in Kvaerner in 1996 was 62,000 and 29,000 in 2000. Thus, among the largest manufacturing corporations, when Kvaerner is left out, there is a trend of continuous aggregate growth in their foreign operations throughout the period.

The largest private sector corporations

As already stated, and also shown in Table 5.16, the 30 largest private sector corporations saw employment growth from 1996 to 2006 even when Kvaerner is included. When employment figures for the largest private sector corporations are split on employment in domestic and foreign entities, it is evident that there was a decline in domestic employment for these corporations between 1996 and 2006. At the same time their foreign employment increased.

Table 5.16: NORWAY: Domestic and foreign employment in the 10 and 30 largest corporations in the private sector, 1996 and 2006. 1000 employees

	1996	2006
10 largest	214	222
<i>Domestic</i>	95	83
<i>Foreign</i>	119	139
11-30 largest	87	95
<i>Domestic</i>	61	54
<i>Foreign</i>	26	41
30 largest	301	317
<i>Domestic</i>	156	138
<i>Foreign</i>	145	179

These patterns of growth, which are revealed for the largest private sector corporations, are the same as pointed out for the group of largest manufacturing corporations when Kvaerner is taken into account. The patterns described also hold for both the ten largest as well as for the next 20 of the 30 largest private sector corporations.

The industrial role of the largest corporations

In the political discourse it is frequently assumed that the largest corporations also serve as engines of the economy. This may partly be because a company that is large will matter more to local communities, to industries and to the national economy than a small company, simply because of its size. It is, however, frequently argued that the largest corporations also serve as *the* engines of the economy. These arguments partly relate to subcontracting issues, where the largest are presumed to offer jobs and learning opportunities for smaller domestic firms. Partly they relate to learning opportunities for domestic businesses more indirectly, either because the largest corporations tend to demonstrate good economic performance with regard to productivity and profitability, or because they are expected to be a source of productivity-enhancing spillovers originating from international experience and R&D activities, that also generate their firm-specific competence.

Such presumptions form the base for political lobbying, or political rent seeking as it is called by economists. This is an issue in all countries. There is, however, no hard evidence that the largest companies play a particular role in the national economies, which should imply that their perception of business opportunities or economic problems should matter more to politicians and the government. In this section, we will try to look closer into information that may shed light on to what extent the largest Norwegian corporations may be considered *the* engines of the economy. First we consider their relative share of domestic activities; to what extent do they have an economic impact simply because of their size? Then we consider their impact more indirectly through multiplier and spillover effects.

The relative size of the largest corporations

The largest manufacturing corporations

Large corporations attract a lot of interest and attention in the economic and political discourse, and presumably more the more dominant they are in the domestic economy. In this sense, their importance may be illustrated by calculating their size relative to figures for the national economy. We should, however, bear in mind that this approach will overestimate

their relative size when comparing their activities with the activity within one sector of the national economy, such as for instance manufacturing. This is caused by the fact that the corporations which are classified as manufacturing corporations, will also be engaged in industrial activities that are not manufacturing. This holds more for some than for others. However, overestimation is bound to take place.

Such calculations are made in Table 5.17. We know that employment in Norwegian manufacturing declined more or less continuously from 385.000 in 1975 to 275.000 in 2006. At the same time total employment in the 30 largest manufacturing corporations rose. Thus, the magnitude of their industrial operations worldwide increased significantly relative to Norwegian manufacturing. This is clearly seen for the ten largest corporations. Since the mid-1990s employment in the ten largest manufacturing corporations has added up to more than half of total employment in the manufacturing sector in Norway. The relative growth of the next 20 on the list, has been much weaker over these 15 years.

The employment growth within the largest manufacturing corporations has primarily taken place abroad. Thus, when considering their employment figures in entities which are located in Norway, their size relative to Norwegian manufacturing is much smaller. Total domestic employment among the 30 largest manufacturing corporations adds up to less than 30 per cent of employment in Norwegian manufacturing, and the relative size of their domestic activities has by and large declined since 1980.

Table 5.17: NORWAY: The relative size of the 10 and 11-30 largest manufacturing corporations, 1975-2006. Total number of employees in worldwide and domestic operations in per cent of manufacturing employment in Norway

	1975	1980	1985	1990	1996	2000	2006
Worldwide activities, <i>share of Norwegian manufacturing</i>							
10 largest	18	28	26	39	64	57	56
11-30 largest	12	18	15	16	17	13	17
Domestic activities, <i>share of Norwegian manufacturing</i>							
10 largest	17	25	19	25	24	22	20
11-30 largest	11	16	13	11	11	7	9
Domestic activities, <i>share of private sector in Norway</i>							
10 largest	5	5	4	5	5	4	3
11-30 largest	3	3	3	2	2	1	1

Altogether, this should suggest that the largest manufacturing corporations in Norway, neither individually nor considered as a group of the ten or 30 largest, by no means hold a dominant position in Norwegian manufacturing. When comparing the size of these corporations with the whole private sector, their relative position is obviously even less pronounced. Then the domestic employment of these corporations does not even exceed five per cent.

The largest private sector corporations

We know that total employment in the 30 largest private sector corporations in Norway is larger than for the largest Norwegian-based manufacturing corporations. Thus, as shown in Table 5.18, their share of private sector employment in Norway is also somewhat higher. It is, however, still quite clear that their relative size is rather moderate. Employment in their worldwide operations adds up to roughly 20 per cent of private sector employment in Norway. Their domestic operations add up to less than ten per cent. Compared to 1996 these shares have been slightly declining.

The relative size will, of course, differ depending of what kind of comparisons that are applied. Large corporations may be dominant in their sector, such as Statoil in Norwegian oil and gas, and DnBNOR in Norwegian banking and financial intermediation. However, with the exception of Statoil's importance for state revenues, exports and even value added, the largest corporations are by no means dominant in the national economy of Norway.

Table 5.18: The relative size of the 10 and 11-30 largest private sector corporations, 1996 and 2006. Total number of employees in worldwide and domestic operations in per cent of private sector employment in Norway

	1996	2006
Worldwide activities, <i>share of private sector in Norway</i>		
● 10 largest	15	13
● 11-30 largest	6	6
Domestic, <i>share of private sector in Norway</i>		
● 10 largest	7	5
● 11-30 largest	4	3

The largest corporations as a source of multiplier and spillover effects

In the mid-1990s we made a study of domestic SMEs, i.e. small and medium size enterprises in Norwegian manufacturing, focusing on their relationships with the largest manufacturing corporations in Norway. The intention was to investigate what the largest companies meant for the business and competitiveness of SMEs. It was documented (Heum, 1996) that SMEs frequently provided the largest companies with goods and services. But the magnitude of such sales or subcontracting was quite modest from the largest companies' point of view. The number of employees in manufacturing SMEs that could be assumed to have the largest corporations as their market base, amounted to six to seven per cent of manufacturing employment in Norway. This means that subcontracting from the largest companies did not play any major role in the Norwegian economy. There is no reason to expect any noteworthy changes in this respect over the last 10-15 years.

In the same study, the largest companies were perceived by SME managers to be important for SMEs because of the experience they gained from international competition and their investments in technology and business development. However, when examining if business relations with the large corporations had any impact on the profitability and growth of SMEs, no clear relationship was established. Neither did they have any impact on to what extent SMEs engaged in R&D. The only factor that seemed rather consistent was the fact that the more SMEs were in direct contact with large corporations, the less engaged they were in foreign sales.

There is no documentation that the economic performance of the largest corporations is superior to how other companies in the economy perform. For the sake of information: value added per employee in 2006 was 10 per cent higher for the 30 largest manufacturing corporations compared to the industry average of Norwegian manufacturing. This difference in labour productivity is not, however, consistent over the years 1996-2006. The average profit margin of the 30 largest manufacturing corporations also seems to be higher over these years than the profit margin that is recorded for the whole manufacturing sector according to Norwegian census data.

The data on the 30 largest corporations cannot, however, be used as simply as this to investigate differences in productivity and profitability between the really large manufacturing corporations and domestic manufacturing, or between the largest corporations and companies more generally in the private sector for that sake. More work is needed to ensure comparable sets of data. We know that data on the largest manufacturing corporations also include non-manufacturing activities, which in many cases are quite extensive. Further we know that data on the largest companies include information on their foreign and domestic operations, whereas industry data only cover domestic value generation. For this reason straight-forward comparisons are not recommended. Furthermore, we would have to take other factors that may be expected to cause differences in economic performance into consideration. Differences in the composition of industries for the companies in the two data sets, are an obvious factor. Thus, broader based sets of micro data are needed to conduct a proper statistical analysis to conclude on how different groups of firms differ from the industry average or from each other.

We do not know of any Norwegian studies where the entities of the 30 largest corporations have been identified in census data in order to have them compared with the industry average. It would also be hard to make a convincing theoretical argument that the economic performance of exactly the 30 largest corporations should be expected to differ from how the other companies perform. Theoretical considerations would rather lead to questions looking into foreign owned vs. domestically owned firms, state owned vs. privately owned firms, or firms with multinational vs. national production. None of these categories will, however, capture all the 30 largest companies. Rather the group of the 30 largest consists of firms which (may) fall into all of these categories. We know, however, that most, but not all, of the 30 largest are classified as domestic multinationals. Being the largest also means that they will comprise the most important multinational corporations of domestic origin and ownership in Norway.

Several analyses based on census data of manufacturing firms show that domestic multinationals are generally more productive than national companies, and also more than foreign owned corporations. Norwegian data also show that they are more profitable than national companies, which again show higher profitability than foreign owned companies (Balsvik et.al., 2009). This seems reasonable as there are reasons to expect that it is the more competitive companies that expand internationally, i.e. which become a domestic multinational. However, data also show that their profit margins are reduced when the companies change status from a national to a multinational company, which is consistent with what we should expect if multinational companies engage in global tax planning.

The 30 largest manufacturing corporations are on the average more internationally oriented than other firms. Among the 30 largest we also find the major domestic multinationals. These are the domestic companies that are most engaged in international operations, and most exposed to international competition. This provides learning opportunities, through which insights and knowledge are achieved, and from which competence that strengthens competitiveness is developed.

Another source of competence that may strengthen the competitiveness of firms is investments in R&D. In Heum and Ylä-Anttila (1993) we documented that the R&D expenses of the 30 largest manufacturing corporations added up to 60-80 per cent of R&D in

Norwegian manufacturing. We did not, however, find that R&D had any significant impact on the internationalization among the 30 largest corporations in Norway (Braunerhjelm et.al., 1998).

From our current study, we find that the R&D expenses worldwide of the 30 largest manufacturing corporations in 1996 amounted to 75 per cent of R&D in Norwegian manufacturing, compared to about 60 per cent in 2006. These figures indicate that the largest corporations are relatively strongly engaged in R&D by Norwegian standards. On the other hand, however, the R&D-intensity measured as R&D-expenses in per cent of total sales, is very low both for the largest corporations and for Norwegian industry as a whole. For 1996, the R&D intensity among the 30 largest manufacturing corporations is estimated to 1.6 per cent, while it was 1.5 per cent for Norwegian manufacturing the year after. In 2006, the R&D-intensity among the largest manufacturing corporations had declined to less than 1 per cent, while it had fallen somewhat less, to 1.2 per cent, in the manufacturing sector.

In 2006, none of the Top 10 manufacturing corporations had an R&D-intensity that exceeded one per cent. Lower down on the Top 30 list, there are only two companies with an R&D-intensity above five per cent. We know that the R&D-intensity is higher for some small manufacturing companies. However, this does not change the fact that the R&D-intensity is low for the industry average, as well as for the great majority of the smaller and larger corporations in Norway.

Despite this low R&D-intensity, there may still be spillovers from R&D or from industrial competence generated from the international operations of the largest and most internationally oriented corporations. At least Balsvik (2009) finds that labour mobility from multinationals to national firms, i.e. from both foreign and domestic multinationals to national firms, generates positive spillovers when studying census data on Norwegian manufacturing for the years 1990-2000. Workers with experience from multinationals who began working in a national firm contributed 20 per cent more to the productivity of their plant than workers without experience from multinationals.

Concluding remarks

In this study we have documented that the growth pattern of the 30 largest corporations in Norway since the mid-1990s and at least until 2006 also seems to follow the growth pattern of the 30 largest manufacturing corporations during 1975-1990. The magnitude of their industrial operations is increasing. In particular it is their operations abroad that grow, while their industrial operations in Norway stagnate and even decline. This holds for the largest private sector corporations for the years 1996-2006. And it holds for the largest manufacturing corporations since 1990 in general when we take the rapid rise and fall of the Kvaerner corporation into account.

Nevertheless, even though the industrial operations of the 30 largest corporations in Norway grow in size, their share of the domestic economy is rather modest. This is rather apparent when considering their share of Norway's private sector.

Even though the largest corporations by no means are dominant in the Norwegian economy, they may still play a role for how productivity develops, for instance from industrial competence that is generated from their international operations. This dynamic role, however, prescribes turbulence among firms as a necessity, which presumably should also include the largest corporations. Thus, the low stability which we have observed in the ranking of the 30 largest corporations in Norway may be considered an advantage at the national level. This is in accordance with Fogel et.al (2006) who have investigated the relationship between stability in the ranking and economic growth of Top 10 corporations in 44 countries. Their finding is that higher stability within the group of the largest corporations (in the private sector) correlates negatively with rising income and productivity:

Countries whose rosters of big business change less from 1975 through 1996 exhibit slower economic growth and total factor productivity growth in the 1990s. This effect is most evident in higher income countries, where stable lists of leading businesses also correlate with reduced capital accumulation in the 1990s. This effect is not due to new behemoths arising to push aside still thriving giants of 1975. Rather, it largely reflects old giants waning as new ones wax large (p. 33).

The negative relationship between stability within big business and economic growth may be explained both by political rent-seeking and risk aversion. The rent-seeking argument is based on an assumption that big business is well positioned to forward their interests into the political system. In that sense high stability within the group of the largest corporations may reflect that they are able to influence political decisions in their own favor, meaning that it is those that are related to these businesses that benefit, and not the economy as a whole. The risk aversion argument is based on the assumption that people in general fear the loss of a current set of jobs, even though it may be assumed that better jobs are likely to come along. This in turn will be reflected in political decisions, even though these decisions may slow down growth.

It seems like Norwegian politicians so far, despite huge state oil revenues, have avoided the trap of becoming defenders of positions that are acquired by the largest corporations. Politicians and the government are exposed to lobbying, which could easily pervert policies in such directions. It is crucial for the future economic development of the Norwegian economy that the industrial dynamics that have been played out until now, are also sustained in the years to come.

Appendix: The 30 largest firms in Norway in 2006

A. Manufacturing firms

Rank	Firm name	Number of employees
1	Aker	46255
2	Norsk Hydro	33605
3	Orkla	28664
4	Norske Skogindustrier	9372
5	Yara International	7060
6	Nortura	5489
7	Jotun	5331
8	Tine	5025
9	Umoe	3867
10	Alpharma	4500
11	Rieber & Søn	3806
12	Aibel	3488
13	Kongsberg Gruppen	3485
14	Moelven Industrier	3175
15	Kongsberg Automotive	2727
16	Elopak	2694
17	Kverneland Group	2615
18	Siemens	2371
19	Rolls-Royce Marine	2142
20	Tomra Systems	2006
21	Kraft Foods	1972
22	FMC Technologies	1881
23	Scana Industrier	1835
24	Scancem International (Heidelberg Cement Norden)	1759
25	Ekornes	1545
26	Frank Mohn	1425
27	Johan G. Olsen	1390
28	REC	1385
29	Kitron	1307
30	Skanem	1108

B. All sectors

Rank	Firm name	Number of employees
1	Aker	46255
2	Telenor	35600
3	Norsk Hydro	33605
4	Orkla	28664
5	Statoil	25435
6	Wilh. Wilhelmsen	13500
7	DnB NOR	11993
8	Norske Skogindustrier	9372
9	Norges-gruppen	9255
10	Schibsted	8581
11	Varner-gruppen	7442
12	Yara International	7060
13	Det norske Veritas	6765
14	Veidekke	6351
15	Nortura	5489
16	Jotun	5331
17	Petroleum Geo-Services	5130
18	Seadrill Norge	5100
19	Tine	5025
20	Alpharma	4500
21	Skanska Norge	4315
22	ICA Norge	4043
23	Umoe	3867
24	EDB Business Partner	3849
25	Color Group	3821
26	Rieber & Søn	3547
27	Aibel	3488
28	Odfjell	3487
29	Kongsberg Gruppen	3485
30	Moelven Industrier	3175

Chapter 6

Large corporations in the Estonian economy

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Introduction

The re-establishment of Estonia's political and economic independence from the Soviet Union took place in August 1991. Since then Estonia has undergone strong liberalization of trade and capital markets, and the state's direct involvement in economic life has decreased remarkably. In order to allow technology transfer, the improvement of managerial skills and more effective market competition, large-scale privatization was undertaken in Estonia and already by 1995 most companies were privatized. Most of the FDI to Estonia have originated from the neighbouring Nordic countries and FDI plays a crucial role in the economy.

The development of the Estonian economy in 2000-2006 is characterized by relatively high economic growth figures (both GDP and export growth) and it seems that Estonia has found its place in the global production networks. At the same time it has been observed that during the current fast export- and consumption-based growth, the technology and skills intensity in the economy has decreased (Tiits et al. 2003; Kattel and Kalvet 2006; Tiits et al. 2008). The globalised economy, however, makes price competition global and allows multinational corporations to continuously develop through subcontracting and to find advantages in price competition – whereby value chains are becoming more global and less geographically and politically defined. Large production units and mass employment are substituted by highly specialized networks that operate and source production and knowledge, often supra-regionally or even globally (Ernst and Kim 2002; Yi 2003; Gallagher and Zarsky 2007).

As a small country with a population of only 1.4 million Estonia can necessarily not be home base for many large multinational corporations, although some small countries, such as the Nordic, are. Their rapid internationalization took place in the 1980s. For Finnish companies the foreign expansion took place through mergers and acquisitions in the lines of business in which the companies were already operating. Although internationalisation can take place in

other forms as well, it is clear that in order to succeed in the globalised world, one has to participate in the global networks and the largest companies are generally better equipped for that and for R&D for innovation.

Aims of the study

This country chapter aims at presenting the role of the largest firms in the Estonian economy for the period 2001-2006. Due to the heavy presence of FDI in the Estonian economy, we look at the foreign ownership of the largest Estonian firms as well as the activities of the Nordic subsidiaries in Estonia, thus complementing the previous chapters on the large firms of the Nordic countries.

Data sources and construction of datasets

Due to limited availability of data, the dynamic turbulence in the structure of the largest corporations in the years following Estonia's regained independence in 1991, and limited resources, it has been impossible to produce information on the 30 largest companies for every year of the 1996-2006 period. Thus, analysis of rank stability, for example, has not been possible. Still, in line with the research of the project partners, two parallel datasets were constructed. The first one consists of the 30 largest manufacturing firms measured by total employment (i.e. employment includes both employment in Estonia and abroad) as of 2006. The second dataset consists of the 30 largest firms in all fields (2006).¹ For these companies data have been collected annually to cover the 2001-2006 period.

Identification of the largest companies was carried out with the help of the Estonian Business Registry, and it was complemented with information from "Äripäev", the Estonian business newspaper, and Statistics Estonia. Some organizations – such as public hospitals and State

¹ The author is grateful to all individuals who helped with the research. Special thanks go to the project partners – the authors of other country reports – from whom I learned a lot, but also to Aavo Heinlo (Statistics Estonia) and Anne Jürgenson (PRAXIS Center for Policy Studies) who helped with data gathering and analysis. The usual disclaimer applies.

Forest Management Centre – were excluded from the list as a result of unified methodology agreed between the project partners.

The firm-level dataset is collected from various sources. Most of the financial and employment data were provided by the Estonian Business Registry. However, to fill in the missing gaps and for consolidation of group data, annual reports from the companies have been examined to extract relevant data. Information on foreign ownership was obtained from the Estonian Business Registry, but also extracted from annual reports of companies.

For the analysis of foreign affiliates a common data source - the Orbis database - was used. The data was extracted from Orbis database by Mika Pajarinen (ETLA) based on the company lists produced as described above. The Orbis database, which is generated by Bureau van Dijk Electronic Publishing, enables us to estimate the geographical orientation of top 30 firms' foreign production and other activities. Although the database generally includes quite comprehensive information, there are problems with lack of data on recent changes in multinational activity in the Nordic/Baltic region, which are documented elsewhere (see Ekholm and Hakkala 2008, 15).

It has to be noted that the data are not necessarily homogenous in all details. For example, sometimes the number of employees reflected in the annual report is the number of employees on average (per annum), sometimes it reflects the number of employees at the end of a year, and sometimes full time equivalents were used. When noticeable changes took place in data series, different data sources are consulted. In some consolidated reports it was also difficult to understand whether the data that were presented, covered the whole group or just the holding company. In some cases even mixed approaches were identified – for example, the turnover reported was the group turnover, while the number of employees was that of the holding company. Another problem was related to accounting for mergers and acquisitions which were rather frequent over the period covered.²

² ABB AS is a typical example. It has been operating in Estonia since 1992 when ABB Estonia AS and ABB Harju Elekter AS were established. The following companies were established over time: ABB EE Service Eesti AS (1994), Elpec AS (1994), ABB Kunda Service AS (1998). The latter four were established together with local partners, but over time ABB's share increased to 100%, except for Elpec AS that was sold in 2000. 2001-2005 consolidation of the companies into ABB Eesti AS took place.

Descriptive analysis of the 30 largest firms in the Estonian economy

The role of the 30 largest firms in the Estonian economy

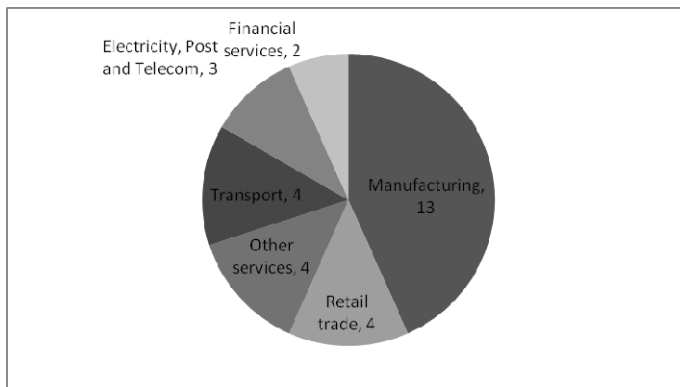
Table 6.1 shows private sector employment in Estonia by industry since the turn of the millennium. The total number of employees in the 30 largest companies in 2006 was 79,300, corresponding to 16% of the total employment in the private sector (see Table 6.1). The Estonian manufacturing sector at the same time was more concentrated, and the 30 largest companies were employing 35,400 employees corresponding to 27% of the total manufacturing employment. This, however, only made up 7% of private sector employment in Estonia.

Table 6.1: ESTONIA: Private sector employment by industry. 1000 persons

	2000	2001	2002	2003	2004	2005	2006
Economic activities total	407.4	411.7	429.4	438	443.5	458.4	483.5
Agriculture, forestry and fishing	37.4	37.1	38.2	34.7	33.2	30	29.7
Mining and quarrying	1.8	1.3	4.9	4.6	3.5	2.5	2.6
Manufacturing	124.9	126.9	125.1	129.7	137	134.6	132.3
Electricity, gas, steam and air conditioning supply	3.4	2.6	3	3.2	3.6	4.7	4.3
Water supply; sewerage, waste management and remediation activities	2.5	2.8	2.7	3.4	4.2	3.1	..
Construction	37.8	35.6	37.9	42.7	47.1	48.2	62.4
Wholesale and retail trade; repair of motor vehicles and motorcycles	77.1	82.4	84.3	79.4	78	79.7	87.8
Transportation and storage	34	34.1	41.1	42.3	37.1	40.4	46
Accommodation and food service activities	18.4	16.1	15.5	16.3	15.1	19.7	19.8
Information and communication	10.4	11.4	9.7	8.7	11.5	14	14.2
Financial and insurance activities	6.9	6.7	7.4	7.4	7.6	6.9	7.6
Real estate activities	7.6	7.8	11.2	10.3	9.6	9.5	9.1
Professional, scientific and technical activities	13	10.4	9.2	11.2	10.5	13	15.1
Administrative and support service activities	9.8	11.8	14.6	14.3	13.4	17.1	15.1
Education	2.9	2.6	3.4	4.9	3.7	2.3	3.9
Human health and social work activities	4.8	6.2	7	10.5	13.4	13.7	11.5
Arts, entertainment and recreation	4.2	4.9	4.4	5.5	4.2	4.8	6.4
Other activities	8.9	9.8	8.9	8.9	10.2	13.2	14.4

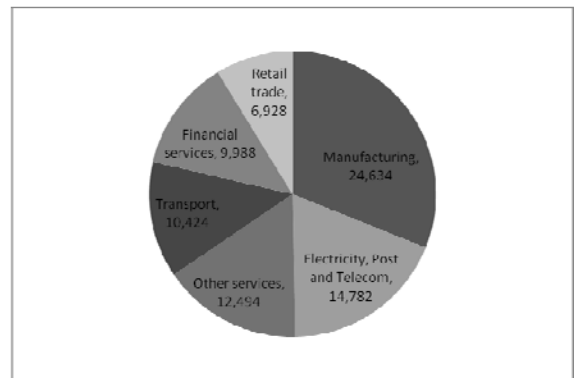
Source: Statistics Estonia 2008a

The biggest company in Estonia is Eesti Energia AS with its local subsidiaries and two small subsidiaries abroad. Eesti Energia AS is an energy company involved in the production and distribution of electricity. Among the 30 largest companies there are four state-owned companies. When looking at the number of employees, Eesti Energia is closely followed by AS Hansapank, active in financial intermediation and having employees in all the Baltic countries and Russia. Among the 30 largest private sector companies there are 13 manufacturing firms with a total of more than 22,000 employees (Figures 6.1 and 6.2).



Source: author's calculations

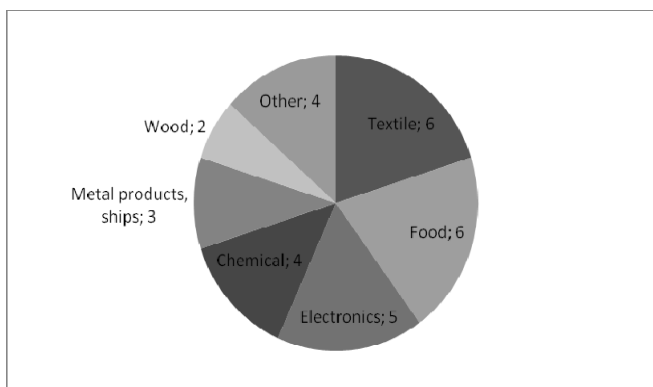
Figure 6.1: ESTONIA: The 30 largest firms by sector, 2006



Source: author's calculations

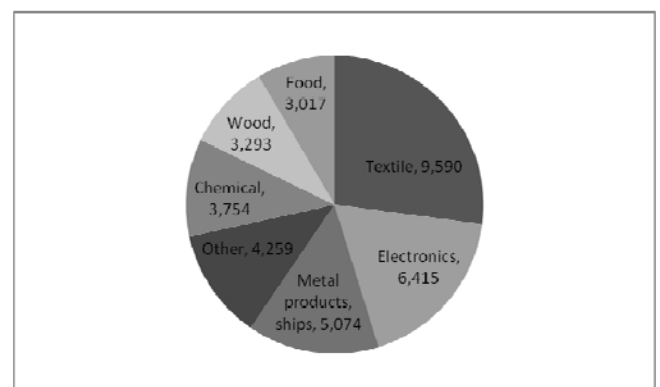
Figure 6.2: ESTONIA: Employment in the 30 largest firms by sector, 2006

Of the largest manufacturing companies six operate in textiles and six in the food sector, while five are in electronics. The size of these companies differs. Measured by the number of employees, the largest sub-sector is still textiles with 9 590 employees, followed by electronics, metal production and ship-building. Companies from these three sectors account for 60% of the employment of the largest manufacturing companies (Figures 6.3 and 6.4).



Source: author's calculations

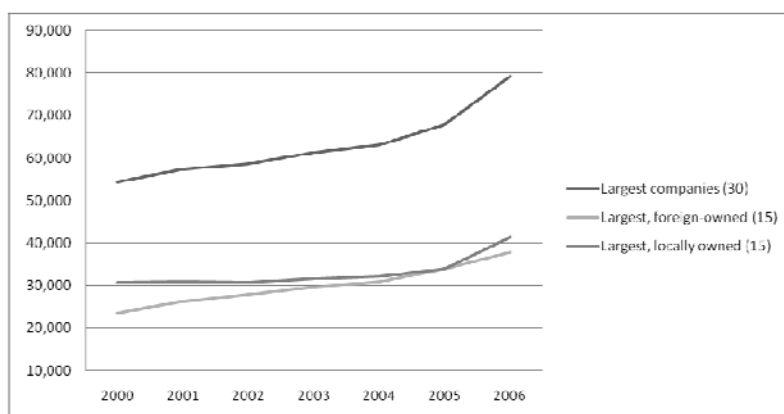
Figure 6.3: ESTONIA: The 30 largest manufacturing firms by subsector, 2006



Source: author's calculations

Figure 6.4: ESTONIA: Employment in the 30 largest manufacturing firms by sub-sector, 2006

When considering the ownership of the largest companies, we distinguish between those owned locally and those owned by foreign corporations.³ Among the largest private sector companies, both groups of companies are showing steady growth (Figure 6.5). However, employment in the large foreign-owned companies has grown faster with an average annual growth of 10%. For the locally owned companies the average growth rate has been 5.7%. Total employment of the largest private sector companies has increased with 45% from 2000 to 2006. According to Table 6.1, the increase in total private sector employment in Estonia in the same period was 19% indicating that the role of the largest companies in the Estonian economy has been increasing. The increase would have been even higher if state-owned enterprises were excluded as employment decreased in all of these during this period. Although some of the employment was generated abroad (especially by Hansabank and Tallink Grupp), a strengthening of the large enterprises locally certainly took place over the six-year period from 2000 to 2006.

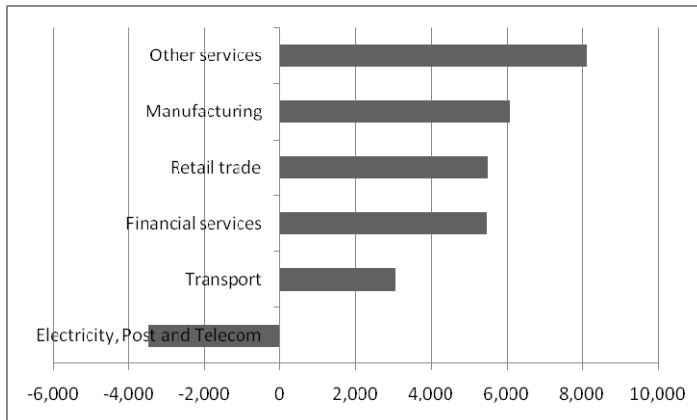


Source: author's calculations

Figure 6.5: ESTONIA: Employment in the largest private sector companies, 2001-2006

Employment in the 30 largest companies has increased most in the retail trade (increased by 500%), almost tripled in the services group consisting of security services, industrial cleaning and entertainment, but also doubled in the financial services field (Figure 6.6).

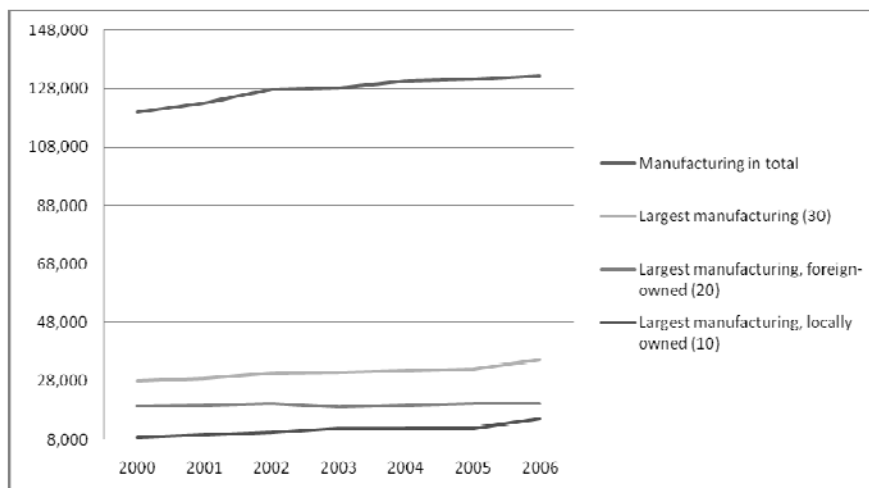
³ Foreign ownership is defined here as foreign ownership of 50 or more per cent as of 2006.



Source: author's calculations

Figure 6.6: ESTONIA: Employment growth in the 30 largest private sector companies by industry, 2001-2006

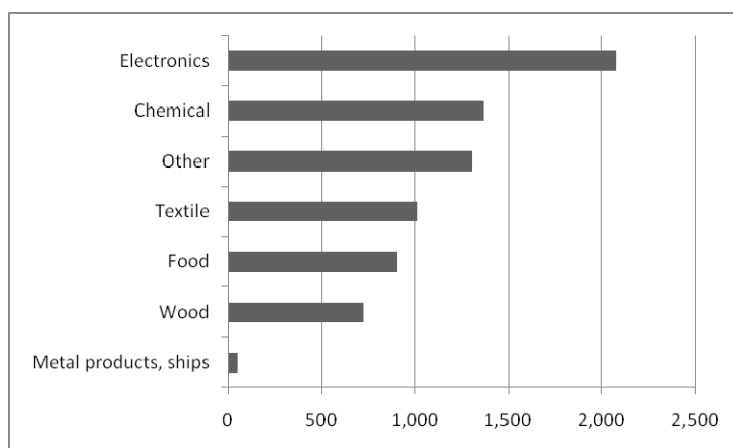
Although the largest manufacturing companies that belong to the group of the 30 largest private sector companies in Estonia have increased their employment since 2000 (Figure 6.6), a different picture emerges when all the 30 largest manufacturing companies are considered. We observe a small increase in employment during the period 2000-2006 for the whole manufacturing industry in Estonia (Table 6.1). Still this employment growth is weaker than for the 30 largest manufacturing companies, meaning that the share of employment by the largest companies has increased from 23% in 2000 to 27% in 2006. However, employment within the 20 foreign-owned of the 30 largest manufacturing companies has remained rather stable, while the ten locally owned large enterprises have increased their employment by 75% (Figure 6.7).



Source: Statistics Estonia 2008a, employees in manufacturing in total = Number of persons employed in the manufacturing sector

Figure 6.7: ESTONIA: Employment in the 30 largest manufacturing enterprises, 2000-2006. Total and for the 30 largest companies by foreign and domestic ownership

The 30 largest companies show employment growth in all industries in which they have their industrial base (Figure 6.8), and the strongest growth has been for the companies in electronics.



Source: author's calculations

Figure 6.8: ESTONIA: Employment growth in the 30 largest manufacturing companies by sub-sector, 2001-2006

Due to missing data and possible methodological problems we are unable to draw definite conclusions regarding the correlation between labour productivity and ownership (local/foreign) or on a sectoral basis. Still, labour productivity indicators for some of the

largest private sector companies and the largest manufacturing companies indicate that labour productivity as well as labour costs are remarkably low in several cases.⁴

Foreign ownership and location of foreign subsidiaries

When we look at the 30 largest private sector companies for 2006, there are 15 companies with foreign ownership. In 12 of these the major owner is from Sweden or Finland, and in addition there is also one with major owner from another Nordic country, namely Denmark. Of the other two foreign-owned companies, there is one (Belize) which, according to Estonian media, is owned by local owners. In most cases the foreign ownership is 100%. Multinational corporations with Nordic ownership had 35 519 employees in Estonia (Table 6.2) and they could be found in different economic sectors.

Table 6.2: ESTONIA: The 30 largest private sector companies by major owner's country of registration. Number of firms and employment, 2006

<i>Ownership</i>	<i>No of companies</i>	<i>Employment</i>	<i>Employment (%)</i>
Local	15	41 322	52.1
Sweden	6	18 580	23.4
Finland	6	9 518	12.0
Denmark	1	7 421	9.4
Other	2	2 409	3.0
Total	30	79 250	100.0

Source: author

Of the 13 Nordic owned companies of the 30 largest private sector companies in Estonia, there are nine that belong to one of the 30 largest companies in Sweden, Finland or Denmark. Altogether these employ 27 521 persons in Estonia, which is equal to 35% of the employees in the 30 largest private sector companies in the country (Table 6.3).

⁴ Average labour productivity per person employed on the basis of net sales for economic activities was 63 thousand EUR for companies with 250+ employees and 76 thousand EUR for 100-249 in 2006. For manufacturing companies the respective numbers were 53 thousand EUR and 71 thousand EUR. Source: Statistics Estonia 2008a.

Table 6.3: ESTONIA: Companies among the 30 largest private sector firms with a parent among the 30 largest in another Nordic country, 2006

<i>Estonian company</i>	<i>Employment</i>	<i>Parent company</i>	<i>Country</i>
Hansapank, AS	8 442	Swedbank	Sweden
G4S Baltics, AS	7 421	G4S	Denmark
Elcoteq Tallinn, AS	3 357	Elcoteq SE	Finland
Eesti Telekom AS	2 206	TeliaSonera	Sweden
ISS Holding OÜ	1 489	ISS Palvelut OY	Finland
SEB Eesti Ühispank, AS	1 546	SEB	Sweden
PKC Eesti AS	1 200	PKC Group	Finland
Fazer Eesti AS	948	Karl Fazer	Finland
Norma, AS	912	AutoLiv Holding	Sweden
	27 521		

Source: author

When we look at the panel comprising the 30 largest manufacturing companies, there are as many as 20 which are foreign owned. Of these, 13 are owned by the Nordic MNCs and their total employment is 15 309 which slightly exceeds the employment of the locally-owned companies (Table 6.4).

Table 6.4: ESTONIA: The 30 largest manufacturing companies by major owner's country of registration. Number of firms and employment, 2006

<i>Ownership</i>	<i>No of companies</i>	<i>Employment</i>	<i>Employment (%)</i>
Local	10	15 197	42.9
Finland	6	8 140	23.0
Sweden	4	5 071	14.3
Denmark	3	2 098	5.9
Switzerland	3	1 885	5.3
USA	2	1 199	3.4
Other	2	1 812	5.1
Total	30	35 402	

Source: author

Again, five of the largest Estonian companies are a subsidiary of one of the 30 largest manufacturing companies in a Nordic country. They employ 7 207 people in Estonia (Table 6.5), making up 20% of total employment among the 30 largest Estonian companies.

Table 6.5: ESTONIA: Companies among the 30 largest manufacturing firms with a parent among the 30 largest manufacturing companies in a Nordic country, 2006

<i>Estonian company</i>	<i>Employment</i>	<i>Parent company</i>	<i>Country</i>
Elcoteq Tallinn, AS	3 357	Elcoteq SE	Finland
PKC Eesti AS	1 200	PKC Group	Finland
Fazer Eesti AS	948	Karl Fazer	Finland
Norma, AS	912	AutoLiv Holding	Sweden
Stora Enso Timber AS	790	Stora Enso	Finland
	7 207		

Source: author

For the analysis of foreign affiliates a common data source was used for the whole project - the Orbis database. According to this database, 12 of the 30 largest private sector companies in Estonia own foreign affiliates. They are mostly 100% owned subsidiaries. In five cases the Estonian parent company is actually a subsidiary of a Nordic company. However, in some cases the international scope of Estonian owned companies can be observed, such as the activities of the BLRT Grupp AS and the Tallink Grupp AS. One additional foreign-owned company with two subsidiaries – Stora Enso Timber AS – adds to the list of the largest manufacturing companies.

R&D activities of the largest companies

In many countries the largest enterprises account for a considerable share of domestic R&D activities. For example, the proportion pertaining to the 30 largest firms of the total business sector R&D expenditures carried out in Finland was 61% in 2006, and 76% for the Finnish manufacturing sector (chapter 4). Similarly, 40 percent of all domestic R&D in Sweden takes place within only nine large international firms (chapter 2).

Empirical data regarding the largest Estonian companies show quite a different picture. According to Table 6.6, showing man-years dedicated to R&D in the Estonian business sector, the 30 largest firms account for 21% of total business sector R&D, while the 30 largest manufacturing firms make up 35% of R&D in Estonian manufacturing.

Table 6.6 shows that just a little more than 1600 man-years were allocated to R&D in the Estonian business sector in 2006. R&D activities are more than doubled since 2001, but they

still do not play an extensive role in Estonian business. In this respect it should also be noted that ICT-related R&D personnel (under financial intermediation and computer related activities), that account for 40% of total business sector R&D personnel and where most of the growth has taken place, might be overestimated as not only personnel dealing with actual R&D (as defined in OECD 2002) are accounted for. R&D personnel in the manufacturing sector, accounting for 30% of the total business sector R&D personnel, has not been increasing as fast as total business sector R&D. Also, considerable fluctuations can be observed over time, which may be caused by changes in the way in which data has been collected, or by the inclusion/exclusion of data for a few key players.

Table 6.6: ESTONIA: R&D personnel (in full-time equivalent) in the business sector and the largest firms, 2001-2006

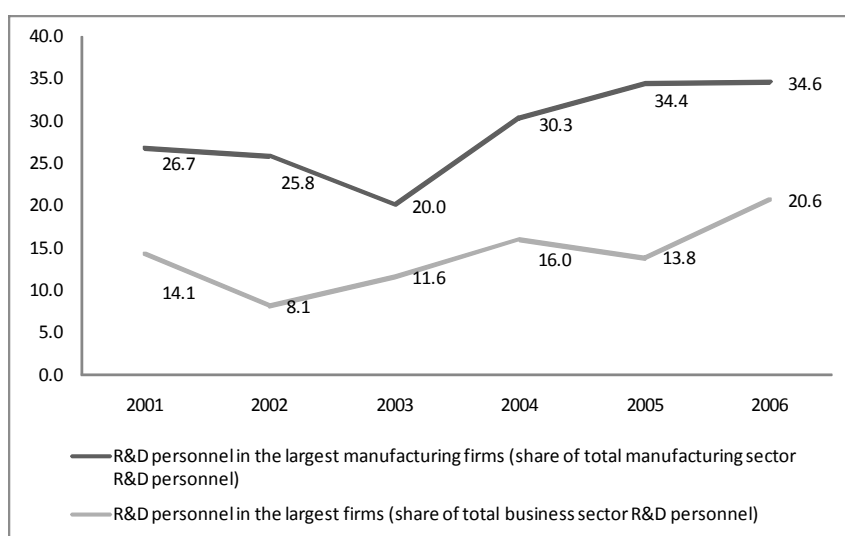
	2001	2002	2003	2004	2005	2006	% total, 2006
Economic activities total	626	702	763	1 084	1 398	1 631	
Financial intermediation			69	81	84	160	9.8
Computer and related activities	82	168	148	332	391	491	30.1
Research and development	30	55	78	82	170	188	11.5
Other business activities	95	99	79	66	105	108	6.6
Manufacturing	333	287	298	445	495	486	29.8
..manufacture of coke, chemical products...	82	65	61	91	85	98	
..manufacture of electrical equipment...	115	106	105	207	203	184	
The 30 largest firms, all sectors	88	57	88	173	193	336	20.6
The 30 largest firms, manufacturing	89	74	60	135	170	168	10.3

Sources: Statistics Estonia 2008a, data on R&D expenditures of the largest companies Statistics Estonia 2008b

As already mentioned, the role of the largest firms is less pronounced in Estonian R&D compared to the role of the largest firms in the Nordic countries. However, the share of R&D in the largest firms, when measured by the number of man-years allocated to R&D, has been increasing. This holds for the largest private sector companies as share of Estonian business sector R&D, as well as for the largest manufacturing companies as share of R&D in the manufacturing sector of Estonia. This is clearly illustrated in Figure 6.9.

It should be noted that according to Statistics Estonia (2008b) about half of the largest manufacturing companies do not report of any R&D. This reflects the dual nature of the Estonian economy: there are several economic sectors, which are important to Estonian employment and GDP, but where the R&D intensity is low. This, for instance, is the case for

the manufacture of food products and beverages, manufacture of furniture, manufacture of wood and wood products, manufacture of textiles and textile products. At the same time there are very R&D-intensive sectors like the manufacture of coke, oil shale and chemical products, and manufacture of transport equipment (see also Kalvet 2006, pp. 4-5). Although data on the R&D efforts of individual companies are rarely available from their public annual reports, R&D expenditures are expected to be most significant among manufacturers of chemical products, manufacturers of transport equipment and accessories, and electrical equipment producers.



Source: Statistics Estonia 2008b

Figure 6.9: ESTONIA: The share of R&D in the 30 largest companies, 2001-2006. Man-years measures as full-time equivalent R&D personnel

Information on R&D expenditures in the business sector provides in most respects the same picture as the one revealed when studying man-years of R&D (Table 6.7). While the 30 largest private sector companies made up 21% of the man-years of R&D, they account for 32% of total R&D expenditures. For the 30 largest manufacturing firms the corresponding figures are 10% and 17% of total business sector R&D, and 35% and 58% when measured as share of R&D in the Estonian manufacturing sector.

The concentration of R&D activities in the largest enterprises can also be observed when considering the data on R&D expenditures: R&D expenditures in the 30 largest private sector companies increased from 12% of total business sector R&D in 2001 to 32% in 2006.

Similarly, R&D expenses in the 30 largest manufacturing enterprises accounted for 41% of total R&D in Estonian manufacturing in 2001 and 58% in 2006.

Most of the business sector R&D expenditures (88%) are intramural. This is even more so for the largest firms in all sectors (91%) and the largest manufacturing firms (92%) (Table 6.7). The fact that the R&D expenses mostly reflect in-house activities in the individual companies, reflects that the linkages between the enterprises and R&D institutions are weak.

Table 6.7: ESTONIA: R&D expenditures in the business sector, 2001-2006. Million EUR

	2001	2002	2003	2004	2005	2006	% (2006)
Economic activities total	20.4	20.3	27.0	37.0	53.0	75.9	
..intramural expenditures	16.4	17.1	22.7	32.2	46.9	67.1	
..extramural expenditures	4.0	3.2	4.3	4.8	6.1	8.8	
Financial intermediation			4.2	4.3	6.2	10.8	14.2
..intramural expenditures			3.9	4.1	6.2	9.7	
..extramural expenditures			0.3	0.2	0.1	1.1	
Computer and related activities	2.0	2.7	1.8	7.0	10.5	19.5	25.7
..intramural expenditures	2.0	2.7	1.8	7.0	10.0	17.7	
..extramural expenditures	n/a	0.0	0.0	0.0	0.4	1.7	
Manufacturing	10.1	10.3	10.7	14.7	21.1	21.9	28.8
..intramural expenditures	9.5	9.0	9.5	12.9	18.9	19.8	
..extramural expenditures	0.6	1.3	1.1	1.8	2.2	2.0	
...manufacture of coke, chemical products...	3.0	3.1	3.0	3.5	3.4	7.2	9.5
...intramural expenditures	3.0	2.8	2.9	3.3	3.3	7.0	
...extramural expenditures	0.1	0.2	0.1	0.2	0.1	0.2	
...manufacture of electrical equipment...	2.5	2.4	1.8	5.1	8.4	6.7	8.8
...intramural expenditures	2.3	2.3	1.7	5.0	8.0	6.6	
...extramural expenditures	0.2	0.1	0.1	0.2	0.4	0.2	
The 30 largest firms, all sectors	2.5	3.0	6.2	9.9	12.0	24.5	32.3
..intramural expenditures	1.5	1.7	5.0	7.0	9.3	22.4	
..extramural expenditures	1.0	1.4	1.3	3.0	2.7	2.1	
The 30 largest firms, manufacturing	4.1	4.3	5.1	6.4	8.7	12.8	16.8
..intramural expenditures	3.9	3.3	4.5	5.4	7.5	11.8	
..extramural expenditures	0.2	1.0	0.6	1.0	1.2	1.0	

Sources: Statistics Estonia 2008a, data on R&D expenditures of the largest companies Statistics Estonia 2008b

Discussion and conclusions

The collection of data on the largest firms in Estonia was no easy task. Several problems and challenges arose, and details may be questioned. Nevertheless, it has been possible to draw a picture of the magnitude and role of the largest firms in the Estonian economy. There is no doubt that their relative importance has been increased since 2000, especially in sectors like retail trade, security services, industrial cleaning, entertainment and financial services. In 2006 the 30 largest firms from all sectors accounted for 16% of the employment in the private sector, compared to 15% in 2000. For the 30 largest manufacturing companies their share of employment in Estonian manufacturing increased from 23% in 2000 to 27% in 2006.

Estonia is in absolute terms a relatively small supplier of imported goods to the Nordic countries (Ekholm and Hakkala 2008, 11-12), although the Nordic countries are the largest export markets for Estonia. Our analysis shows that many of the largest Estonian companies have owners from the Nordic countries: in 2006 13 of 30 largest private sector companies in Estonia had Nordic ownership, while the same was the case for 13 of the 30 largest manufacturing companies. Nine of the Top 30 private sector firms in Estonia are owned by a company that makes the Top 30 list of one of the four Nordic countries of this study. Altogether 34% of the employment in the 30 largest private sector firms in Estonia was in one of these nine companies. For the 30 largest manufacturing companies in Estonia, the number of firms where one of the other Nordic Top 30 companies was the owner is five, and they employed 20% of all the employees in the 30 largest manufacturing firms in Estonia.

Over the period 2001-2006 the 15 foreign-owned companies of the 30 largest private sector companies show an increase of ten% in employment per annum. However, employment in the 20 foreign-owned of the 30 largest manufacturing firms has remained rather stable, while the locally owned manufacturing enterprises among the 30 largest have increased employment by 75%.

It has been assumed that foreign investors in Estonia seek to take advantage of low labour costs, or low local costs in general. However, this does not necessarily follow from the sectors in which foreign companies invest:

If the relatively compressed wage structure in the Nordic countries created strong incentives for Nordic firms to offshore low-skilled jobs, we might expect to see disproportionately large increases in offshoring from industries intensive in low-skilled workers. However, since there may be low-skilled segments within otherwise high-skill intensive sectors, it is difficult to assess the relevance of this argument based on the industry distribution of offshoring measures (Ekholm and Hakkala 2008, 14).

Nevertheless, low-cost driven investments are indicated when looking at the largest foreign-owned companies. Even though possible data problems should be considered, it is rather clear that labour productivity and labour costs are low, which should reflect that the operations of foreign-owned companies are concentrated in the low-skilled segment.

The largest enterprises in Estonia are only rarely engaged with affiliates in other countries. Although 12 of the 30 largest private sector companies own affiliates abroad, the Estonian parent company is actually a subsidiary of a Nordic company in five cases. Only in a few cases can we so far observe a significant international scope of locally owned companies.

It is generally assumed that the largest enterprises in a country account for a considerable share of domestic research and development activities. This seems to be supported by evidence from the Nordic countries. However, in Estonia the 30 largest firms from all sectors account for no more than 21% of total business sector personnel engaged in R&D in 2006. This share was even lower in 2005, when it was 14%. Large variations from one year to the next may, however, indicate possible data problems. Their R&D is also more capital intensive than that of others. This explains why the 30 largest private sector companies have R&D expenses amounting to 32% of all R&D expenditures in the business sector.

The largest manufacturing companies account for 35% of total R&D personnel employed in the manufacturing sector. At the same time about half of the largest manufacturing companies did not report of any R&D expenditures or R&D personnel, and obviously their competitive advantage lies elsewhere.

The concentration of R&D activities has increased since 2001. Then the 30 largest private sector enterprises accounted for 12% of total business sector R&D expenditures, in 2006 their

share had increased to 32%. The 30 largest manufacturing enterprises accounted for 41% of total manufacturing R&D expenditures in 2001, increasing to 59% as of 2006. The dominant share of business sector R&D expenditures is intramural.

For Finland and Sweden an increase has been observed in R&D in foreign subsidiaries in recent years. For the Finnish firms this has especially been the case for the large manufacturing firms, and for the Swedish firms for financial intermediation. This is in line with what we observe in Estonia, especially regarding R&D taking place in the foreign-owned financial intermediation companies. For the manufacturing sector the picture is more heterogeneous and rather seems to confirm that foreign ownership might not generate positive intra-industry spillovers for domestic firms. Several of the largest foreign-owned companies, as well as companies with local ownership which are mainly engaged in subcontracting, have little contact with other Estonian companies or institutions in education and R&D. Thus, the lack of positive feedback mechanisms may generate a considerable problem for the development of the Estonian economy.

Appendix: The 30 largest firms in Estonia in 2006

A. Manufacturing firms

Rank	Firm name	Number of employees
1	BLRT Grupp AS	3698
2	Elcoteq Tallinn, AS	3357
3	Kreenholmi Valduse AS	3078
4	PTA Grupp AS	2909
5	AS Baltika	1915
6	Ekspress Grupp AS	1900
7	Viru Keemia Grupp AS	1295
8	Rakvere Lihakombinaat, AS	1282
9	Alvigo AS	1210
10	PKC Eesti AS	1200
11	Fazer Eesti AS	948
12	Glassek AS	930
13	Norma, AS	912
14	Stora Enso Timber AS	790
15	Kalev, AS	787
16	ABB AS	736
17	Vest-Wood Eesti AS	722
18	Loksa Laevatehase AS	695
19	Kiviõli Keemiatööstuse OÜ	695
20	Balti ES, AS	681
21	Amphenol ConneXus OÜ	616
22	Technomar & Adrem, AS	603
23	Repo Vabrikud, AS	595
24	Balti Spoon, OÜ	583
25	Wendre AS	575
26	Marat AS	563
27	Silmet, AS	554
28	Sangar AS	550
29	Horizon Tselluloosi ja Paberi AS	517
30	Tarkon, AS	506

B. All sectors

Rank	Firm name	Number of employees
1	Eesti Energia AS	8576
2	Hansapank, AS	8442
3	G4S Baltics, AS	7421
4	Tallink Grupp AS	5987
5	Eesti Post, AS	4000
6	BLRT Grupp AS	3698
7	Elcoteq Tallinn, AS	3357
8	Kreenholmi Valduse AS	3078
9	PTA Grupp AS	2909
10	Tallinna Kaubamaja AS	2411
11	Rimi Eesti Food AS	2396
12	Eesti Raudtee AS	2342
13	Olympic Entertainment Group AS	2342
14	Eesti Telekom AS	2206
15	AS Baltika	1915
16	Ekspress Grupp, AS	1900
17	SEB Eesti Ühispank, AS	1546
18	ISS Holding OÜ	1489
19	Viru Keemia Grupp AS	1295
20	Rakvere Lihakombinaat, AS	1282
21	SOL Eesti OÜ	1242
22	Alvigo AS	1210
23	PKC Eesti AS	1200
24	Maxima Eesti OÜ	1114
25	GoBus, AS	1052
26	Tallinna Autobussikoondise AS	1043
27	Sportland International Group AS	1007
28	Fazer Eesti AS	948
29	Glaskek AS	930
30	Norma, AS	912

Chapter 7

The structure and dynamics of large firms on the Nordic-Baltic scene

The point of departure for this study is that the large Nordic firms are affected by some pervasive factors that cut through all the Nordic countries. There are, however, also some notable differences that separate the pattern of adjustment between the firms of these four countries. In this chapter we will focus on similarities and differences in the composition of the largest firms between the Nordic countries, and on the different paths that these adjustment processes have taken. In addition, we will draw on the Estonian country study that focuses more on the other side of the coin, as it looks more at the behavior of Nordic firms in Estonia

Differences in the composition of the largest firms

Size and industry

The 30 largest firms differ significantly in size within and between the countries on the Nordic-Baltic scene. As the country chapters reveal, intra-country size differences are significant in all countries, both regarding the largest manufacturing firms and the largest firms in the private sector. With regard to manufacturing, the greatest internal size differences are found in Norway, while for the largest private sector firms size differences are the most prevalent in Denmark.

As Table 7.1 reveals, there are also significant differences between the Nordic countries in the average size of the largest firms. On the average, Swedish manufacturing firms are the largest, and much larger than those of the other countries. Of the Nordic countries, the largest Norwegian manufacturing firms are the smallest. However, even the large manufacturing firms in Norway are on the average much larger than the largest in Estonia.

The same differences are revealed when the average size of the largest private sector firms is considered. The large Swedish firms are the largest on the average and the large Norwegian firms are the smallest on the Nordic scene, while the largest Estonian firms are even significantly smaller than the Norwegian ones. In Denmark the largest private sector firms on the average employ three times that of the largest manufacturing firms. This is mainly due to the service company ISS, which employs almost 400,000 globally.

Table 7.1: Average worldwide employment in the 30 largest firms by country, 2006

	Sweden	Denmark	Finland	Norway	Estonia
30 largest manufacturing firms	22,245	9,329	14,036	6,328	1,180
30 largest private sector firms	37,447	28,148	17,606	10,584	2,643

The industrial activities of the largest firms differ somewhat between the countries, revealing differences in natural endowments and comparative advantage. In manufacturing, mechanical and electrical engineering makes up a significant part in all countries, and most so in Sweden. When it comes to industries related to natural resources, a large number of Finnish firms are engaged in pulp and paper. In Denmark, the food industry is relatively more dominant, whereas Norwegian firms to a larger extent specializes in energy-intensive chemicals, metal and paper production. Norway also has a significant number of their largest companies in the food industry. This does not, however, reveal comparative advantage, but rather the fact that agriculture is still significantly protected from foreign competition in Norway.

The largest manufacturing firms also make up a significant part of the largest private sector firms in all the countries, and more in Finland than in any of the other Nordic countries. In Norway less than half of the largest manufacturing firms make the list of the 30 largest private sector firms. In Estonia, there are even fewer. The main industry attachment for the largest private sector firms in Norway also reveals the importance of oil as a basis for industrial activities.

Table 7.2: Main industry of the 30 largest firms by country, 2006

	Sweden	Denmark	Finland	Norway	Estonia
Oil, natural gas and related services (11)	0	0	0	4	0
Manufacturing (15-39)	16	17	18	14	12
Electricity and construction (40, 45)	2	3	2	2	1
Services (50-75)	12	10	10	10	17

Ownership patterns

The pattern of ownership for the 30 largest manufacturing and private sector firms is shown in Table 7.3 for the years 1996 and 2006. Apparently ownership competition has increased as reflected by the increasing share of foreign-owned companies and the decrease in state ownership. This holds for the largest private sector firms and the largest manufacturing firms across the Nordic countries.

The magnitude of family ownership among the largest firms differs across the Nordic countries, both within the largest manufacturing and the largest private sector firms. However, in all countries, except for manufacturing firms in Finland, the magnitude of family ownership seems to be rather stable over the period.

Dominant ownership, where 20-49% of the ownership is held by one investor, still plays a significant role among the largest firms, and the number of large firms with this type of ownership has been on the rise in all countries except for Sweden, where it is declining. Denmark seems to have a slightly higher share of dominant owners (often industrial foundations), but overall the patterns are quite similar.

Table 7.3: Top 30 firms by type of ownership, 1996 and 2006. Number of firms

	Sweden		Denmark		Finland		Norway	
	1996	2006	1996	2006	1996	2006	1996	2006
Top 30 private sector:								
• Dispersed ownership	14	15	14	10	14	11	8	6
• Dominant ownership	9	7	10	13	4	10	7	12
• Family ownership	1	1	3	4	1	1	6	6
• Foreign ownership	0	4	3	3	1	3	3	4
• State ownership	6	3	0	0	10	5	6	2
Top 30 manufacturing:								
• Dispersed ownership	17	17	11	8	10	16	6	8
• Dominant ownership	8	3	12	13	6	7	11	10
• Family ownership	1	1	4	4	6	1	6	5
• Foreign ownership	3	9	3	5	3	5	5	7
• State ownership	1	0	0	0	5	1	2	0

State ownership has traditionally played an important role in all Nordic countries with the exception of Denmark. However, state ownership is being phased out as a result of privatization programs in the other three countries. Among the largest private sector firms there are still state majority owned companies in all three countries, and more so in Finland than in the others. Among the largest manufacturing firms only in Finland do we still find one firm that was majority owned by the state in 2006.

Continuous restructuring

In all the four Nordic countries restructuring, measured in terms of rank stability and occurrence of the firms in the top 30 group, seems to have taken place predominantly in the 1990s. With the exception of Norway, a more stable pattern in rank measures can be observed after 2000, i.e. from 2000 in Finland, 2001 in Sweden and 2003 in Denmark. This could partly be attributed to the intense growth in the latter half of the 1990s, paired with the high valuation of firms and high expectations of technological breakthroughs that seem to have spurred a wave of mergers and acquisitions.

There are, however, also differences between the countries. For instance, stability within the Top 30 group, as shown in Table 7.4, is higher in Denmark and Sweden than in Norway and Finland, both with regard to manufacturing and when all private sector firms are taken into account. High stability is also an indication of low mobility among the largest firms, which may reflect less dynamics in company structures. Most dynamic in this sense, seems to be the company structure in Norway. The high mobility among the largest firms in Norway may, however, also reflect the fact that Norway has relatively few national champions, i.e. Norway has more relatively small companies on the Top 30 list as compared to the other Nordic countries (cf. Table 7.1).

Table 7.4: Number of firms that have occurred on the Top 30 list every year, 1996-2006

	Sweden	Denmark	Finland	Norway
Manufacturing firms occurring all years (1996-06)	16	19	14	11
All sector firms occurring all years (1996-06)	15	19	14	8

In Denmark it is clear that those of the top 30 firms, both in manufacturing and the whole private sector, that have improved their ranking are the ones that have managed to shift away from the nationally oriented conglomerates towards the more focused and globally oriented niche firms. The same pattern is appearing in the other countries as well, but it is most noteworthy in Denmark.

Differences in dynamics

Productivity

In terms of productivity most detailed information on the largest firms is presented for Denmark, Finland and Sweden. In Finland and Sweden productivity differs between the group of the 30 largest companies that only contains manufacturing firms and the group including firms from all sectors. In the first group productivity is lower for the largest 30 as compared to total industry average. In Finland, the industry average is also higher than for the top 30 group of all industries, while the opposite pattern emerges for the group including all sectors in Sweden.

If we implement sales per employee as an alternative productivity measure, the differences more or less disappear when the comparison is made between the top 30 firms in manufacturing and the industry average, whereas in the group including all sectors labour productivity is shown to be higher among the 30 largest firms. It is to be noticed that labour productivity seems to be positively correlated with the share of foreign sales, and more so in Finland than in Sweden.

In Denmark the Top 30 firms are generally more productive than the total population of firms measured by net sales per employee. Likewise, the gap in productivity between the Top 30 firms in Denmark and the total population of firms has increased in the period 1996-2006 in line with the largest firms' increased expansion abroad. Unfortunately, in this case Norway cannot be compared to the other countries due to lack of proper data.

Growth and internationalization

Some interesting differences emerge with regard to the growth of the largest firms between the countries:

- A panel of large Swedish firms experienced higher growth in sales in the late 1990s, but lower growth in employment (even negative), contrasting a moderate growth in employment in 2000-2006 combined with constant sales.
- In Finland growth in both of these variables was considerably higher than in Sweden over the entire period and for both sectors, and also exceeded growth of the industry average.
- The Top 30 firms in Denmark have also experienced a relatively higher growth both in terms of number of employees and sales than the total population of Danish firms. However, it is worth noticing that this growth mainly has taken part abroad.
- In the case of Norway, a different image is depicted. In total, the Top 30 manufacturing firms in Norway are employing less people in 2006 than in 1996. However, one company has a heavy impact on this negative growth pattern.¹ Overall,

¹ In the first half of the 1990s Kværner acquired Trafalgar House, which was a UK-based company with activities all over the world. The acquisition meant that Kværner, which had been a company with less than 15,000 employees, suddenly employed more than 70,000, of which more than 60,000 were in foreign units. In 1996, the activity level of Kværner was at its highest. Within a few years, Kværner ran into severe financial problems. Activities were closed down and sold out, and by the end of the 1996-2006 period, Kværner no longer existed as an independent company, and only some core activities had been taken over by Aker. Excluding Kværner, the aggregate figures for the other firms on the Top 30 list show employment growth.

the group of Top 30 companies regardless of industries is expanding considerably abroad, downsizing the domestic employment, and, as a result, growing slightly in total.

In Figure 7.1 the share of foreign sales for the largest manufacturing firms in each country is depicted. The pattern is relatively similar in all four countries. The large firms were highly exposed to foreign sales already in 1996 as the share of foreign sales to total turnover varied between 72% and 84%. This share has increased slightly during the period up to 2006. The relative increase in global sales has been stronger among Danish and Finnish top 30 firms. By 2006 the largest manufacturing firms of Denmark, Finland and Sweden have a share of foreign sales at the level of 85-90%, which is very high, but not unusual for small open economies. The Norwegian top 30 manufacturing firms are on average slightly less exposed to global sales with 76% of the turnover abroad in 2006.

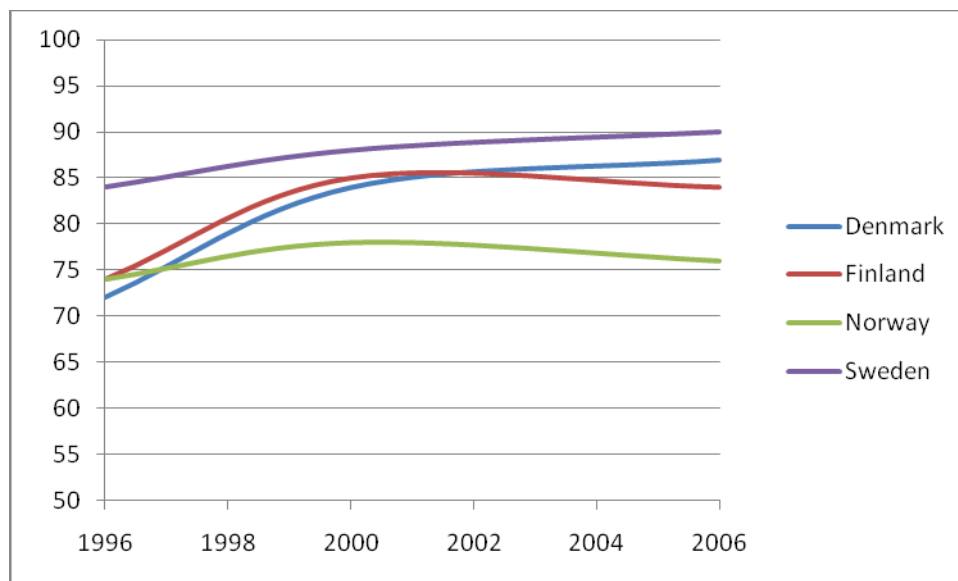


Figure 7.1: Share of foreign sales in total sales for the 30 largest manufacturing firms, 1996-2006²

In the same vein the share of foreign employment is shown in Figure 7.2. Again the top 30 manufacturing firms in Denmark, Finland and Sweden demonstrate a rather similar pattern with a steep increase in the global exposure in terms of foreign employment. With a level of foreign employment equaling 40-60% of their total employment in 1996, foreign employment

² The graph is based on observations from the years 1996, 2000 and 2006 – as we do not have yearly data from Norway, but only data from these three selected years.

increased significantly to 60-75% in 2006. Thus, in Sweden the 30 largest manufacturing firms typically employ three times as many abroad as at home; in Finland and Denmark roughly twice as many, while in Norway 50% more.

The share of foreign employment has increased rapidly over the period in all the Nordic countries, except for Norway, which seems to be an outlier as foreign employment only rose from 57% to 61% from 1996-2006. This is, however, due to the development of one company, Kværner. If Kværner were deleted, the share of foreign employees would have been 39% in 1996, increasing to 61% in 2006. Then the Norwegian pattern is more similar to what is seen in Denmark and Finland, but at a somewhat lower level. Thus, it can be concluded that even though the top 30 manufacturing firms in all the four Nordic countries already were highly exposed to international activities in terms of sales in the mid-1990s, their internationalization has since then increased due to outsourcing of employment in labour-intensive manufacturing and some back-office services, and to ensure market presence.

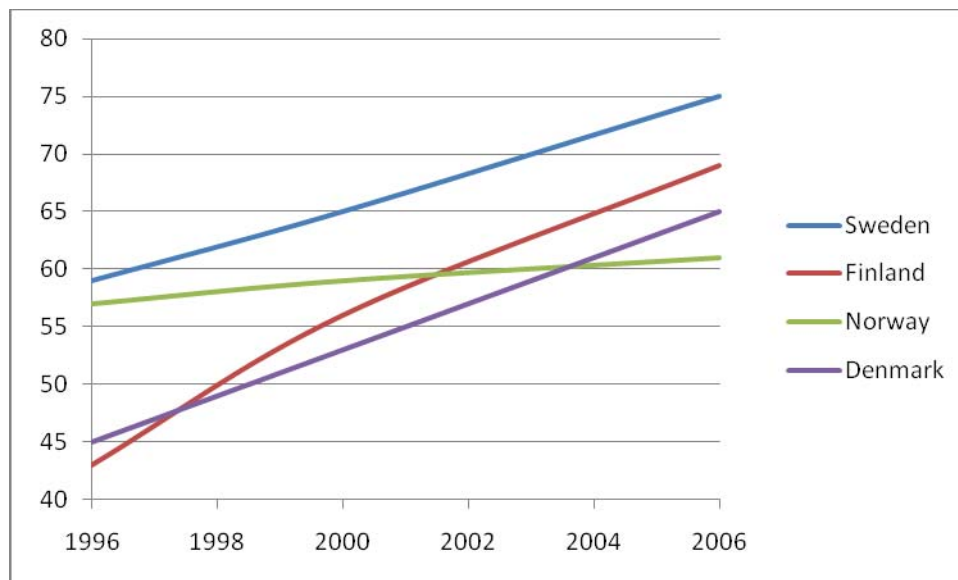


Figure 7.2: Foreign employment as share of total employment for the 30 largest manufacturing firms in each of the Nordic countries, 1996-2006³

In the Estonian country study, the other side of the coin is revealed as Estonian subsidiaries of Nordic firms make the list of the top 30 firms operating in Estonia. Of the 30 largest manufacturing firms in Estonia in 2006, 20 are ultimately owned by a Nordic firm; while the

³ The graph is based on observations from the years 1996, 2000 and 2006 – as we do not have yearly data from Norway, but only data from these three selected years.

same is the case with 13 of the top 30 private sector firms. These Nordic-based firms have played a significant role in the Estonian economy, also with regard to employment and growth. Further analysis of the industries and the labour productivity per employee indicates that the Nordic-owned firms mainly invest in low-skilled segments of the Estonian economy.

Chapter 8

Implications for innovation and growth

A general observation from the country chapters is that the largest firms do play a significant role in the economy of all the Nordic countries, both in terms of their size and in terms of foreign activities. In fact, their substantial foreign activities mean that they should be expected to function as major agents for the restructuring of industrial activities in line with new global opportunities.

The most striking response of the largest firms to the pervasive factors of globalization and digitalization has been to expand their business activities internationally. Actually, for quite a number of the largest firms, business operations truly have a global span. The trend of internationalization can also be seen in Estonia. So far, however, as an emerging economy, Estonia has mostly experienced inward investments, and to a large extent the major firms in Estonia are subsidiaries of multinationals originating in the Nordic countries.

This pattern of growing internationalization implies that the degree of disentanglement of the large firms from their respective Nordic home countries has increased quite notably. What this in turn means for the innovative environment, and, in consequence, for the future economic development on the Nordic-Baltic scene, will to a large extent depend on how strongly these large firms are anchored in their respective home countries.

The largest firms in the home country economy

Value generation

One measure of the strength of the largest firms with regard to value generation in the home country is the number of employees in their domestic units as share of total employment in their home country. We know that the largest firms in general, and as a group, have grown faster than the economy of their home country, and that they primarily have expanded abroad.

Does this mean that their share of domestic activities in the home country has been reduced, or not?

According to Table 8.1, the largest 30 firms accounts for a rather significant share of manufacturing employment in all the Nordic countries, although the exact share varies from country to country. In 2006, the largest manufacturing firms were more dominant in Finland than in the other countries, as they made up 31% of domestic manufacturing employment. Denmark was at the other end of the scale as far as the largest manufacturing firms are concerned, with 25% of employment in domestic manufacturing. The share of the largest firms in Estonia was within the same range.

Table 8.1: The 30 largest firms' share of domestic employment, 1996 and 2006

	Sweden	Denmark	Finland	Norway	Estonia
30 largest manufacturing firms' employment as share of total manufacturing sector					
- 1996	38%	24%	42%	35%	n.a.
- 2006	28%	25%	31%	29%	27%
30 largest firms' (all sectors) employment as share of total employment in private sector					
- 1996	12%	12%	21%	11%	n.a.
- 2006	8%	10%	16%	8%	16%

The share of the largest firms with regard to the whole business sector (private sector) was much smaller. Among the Nordic countries, it was highest in Finland with 16%, while the 30 largest private sector companies were least dominant in Sweden and Norway with 8% of domestic private sector employment. Even though the large firms in Estonia were significantly smaller than the largest firms in the Nordic countries, they dominated the domestic private sector to the same extent as in Finland.

When considering how the home country position of the largest firms has changed over time, Table 8.1 shows that their relative magnitude in general has declined on the Nordic scene. Finland was also the country where the 30 largest firms had the most dominant position in the manufacturing sector in 1996. However, the relative weakening of these firms is most notable in Finland, and also in Sweden, where their share of domestic manufacturing employment has

decreased by 11 and 10 percentage points respectively. The same pattern can also be seen in the manufacturing sector in Norway, but less dramatic as the relative size of the largest firms was smaller already at the outset in 1996. In Denmark the relative size in domestic manufacturing was even smaller, and this relative size has been rather constant throughout the observed period.

The same pattern of development, but not of the same magnitude, can be observed when the domestic employment of the 30 largest private sector firms is compared with total employment in the business sector of the home country. The relative size of the 30 largest firms compared to domestic private sector employment has been reduced in all countries in the time window we look at, from 1996-2006.

Thus, the bottom line is that we have seen rather similar developments in all four Nordic countries where the largest firms still play a significant part in manufacturing, albeit a noteworthy decrease in 2006 as compared to 1996.¹ Their share of total private sector activities is less pronounced and also on the decline in the same period.

Industrial competence generation

Value generation is based on the endowment of industrial competence, and the generation and upgrading of industrial competence in all its forms are the key to competitiveness and growth. There is no clear way to measure how the response of the largest firms to global market forces actually affects industrial competence generation in their home country. Industrial competence develops in different ways. In the literature it is broadly distinguished between experience-based competence building, originating from daily efforts to solve problems that firms are exposed to, and science-based knowledge generation, where problems are dealt with by applying more systematic efforts in research and development.

Experience-based competence building

In all the Nordic countries the Top 30 firms have a larger share of foreign operations than other firms. This means that the largest firms more than other domestic firms generate industrial competence based on experiences from large scale operations and from operating internationally and in other countries. We should expect that the exposure of the largest firms

¹ The same conclusion holds where data are available back to 1975.

in the Nordic countries to such global forces has increased over time, and that they more than before are carriers of experience from international and global business operations. This is a type of experience which contributes to the building of competencies that are of value to actors in the home country economy in general, and that will spill over to other firms through labour movements and subcontracting.

It is hard to say whether the role of the largest firms as a source of experience-based competence generation has increased in importance for the home country economies over the last years. The process of internationalization has become more widely spread among domestic firms, meaning that there are several sources for such competence spillover, and not just the largest firms. Furthermore, as the largest firms make up a smaller share of the home country economy, spillovers due to labour movements may have a smaller range than before. Besides, there also seems to be a trend where outsourcing and subcontracting are increasingly becoming cross-border activities. This presumably concerns the largest firms more than other firms as they are more familiar with the business environment abroad. Thus, the role of the largest firms with regard to experience-based building of industrial competence in the home country economy may still be of importance, but is on the decline.

Research and development (R&D)

When it comes to science-based competence building, as envisaged through engagement in research and development, international statistics, such as OECD's *Main Science and Technology Indicators*, show significant volume growth in R&D expenditures per capita in all the Nordic countries during 1996-2006. In fact, when considering man years that are devoted to R&D, as in Table 8.2, all the Nordic societies stand out as relatively R&D-intensive, and this intensity has increased over time.

Table 8.2: Man years of R&D in all sectors per 1000 inhabitants, 1995 and 2007. The Nordic countries and EU

	1995	2007
Sweden	7.1	8.4
Denmark	5.8	8.6
Finland	6.6	10.6
Norway	5.5	7.2
EU-15	4.3	5.4
EU-27	3.9	4.8

Source: OECD – Main Science and Technology Indicators 2009:2

More or less the same picture is revealed when considering R&D expenses, but with some nuances. In the observed period, expenditures on R&D have increased clearly more than the OECD-average in Finland, and slightly more or equivalent to the average in Sweden, Denmark and Norway. The absolute and relative level of R&D expenditures is highest in Sweden, followed by Finland. R&D in percentage of GDP is also above the OECD average in Denmark, while it is clearly below in Norway. Norway further differs from the other Nordic countries in the sense that relatively less of the R&D is performed in the business sector. Also in this respect Norway is well below the OECD average, while the other Nordic countries are above, and Sweden and Finland clearly more so than Denmark.

R&D is generally unevenly distributed among firms, and a rather small number of firms make up for a substantial share of total R&D. This is also the case in all the Nordic countries and within the group of the 30 largest firms, in manufacturing as well as in the whole business sector. The most extreme is Finland where Nokia alone accounts for almost 50% of total business sector R&D.

It follows from the country chapters that the 30 largest firms in all the Nordic countries, in manufacturing as well as in the whole business sector, account for a larger share of R&D than of employment in the home country. As already mentioned, R&D expenses have increased significantly in all countries, both among the largest firms and in the business sector in general. As domestic R&D in the period considered has grown faster outside the group of the

30 largest firms, their share of R&D in the home country has been declining in all the Nordic countries. However, in Denmark the decline has been marginal as e.g. the large pharmaceutical firms have increased their domestic R&D expenses while other large firms have decreased theirs.

The share of foreign R&D in the groups of the 30 largest firms is much lower than their share of foreign sales and foreign employment in all countries. There is a tendency, however, that even though R&D traditionally has been a more home country based activity, the R&D conducted abroad is picking up. This is illustrated in Figure 8.1 which is based on data from Denmark and Sweden. In Denmark the share of foreign R&D of all R&D conducted by top 30 manufacturing firms has increased from 20% in 1996 to almost 30% in 2006. Sweden has experienced an even more significant increase from 25% to almost 45% R&D conducted abroad.

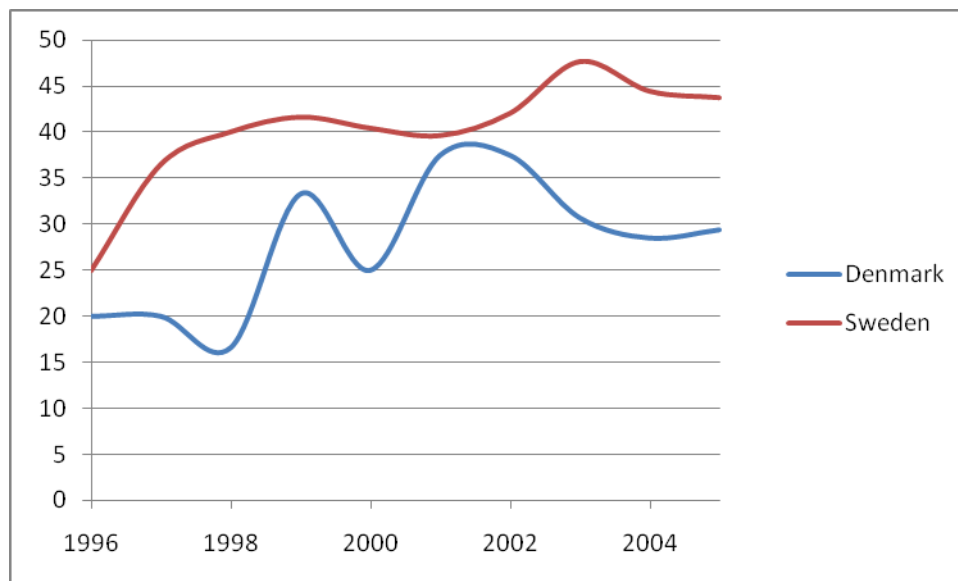


Figure 8.1: The share of R&D expenses that are spent abroad by top 30 firms²

There is no universal trend across the countries as to whether the R&D intensity is higher or lower for the 30 largest firms compared to the average for the manufacturing or business sector in the country. In Sweden and Denmark the largest firms as a group are more R&D intensive than the industry average, while they are less so in Finland and Norway.

² For Denmark this is the share of foreign R&D for top 30 manufacturing firms, while for Sweden it is the share for all the largest firms.

Neither do we see any clear cut trend as to whether R&D intensity at the firm level is on the increase or not. It was higher in 2006 than in 1996 for the 30 largest manufacturing firms in Sweden and Denmark, while it was lower in Norway and Finland. For the 30 largest private sector firms, the R&D intensity declined during the period in Finland, Sweden and Norway, while it was rather stable in Denmark.

Hence, R&D expenditures have increased significantly in all the Nordic countries, illustrating the importance of enhanced knowledge for innovation and international competitiveness. The concentration of R&D and the relative expansion of R&D abroad signal relatively high sensitivity to the location or investment decisions of a small number of firms. On the other hand, the share of home country R&D undertaken by the largest firms is on the decline.

Prospects for innovation and growth

It follows from the previous discussion that the largest firms make up a significant, but declining, part of value added and R&D in the domestic economy of all the Nordic countries. At the same time, they increasingly source resources abroad to operate as global players both with regard to production, outsourcing and enhancement of knowledge and innovation. This does not, however, mean that the prospects for innovation and growth are weakened on the Nordic scene. These prospects will depend on how the factors of production in the Nordic countries may be enhanced and engaged in value addition activities with high productivity in the future.

It is not obvious that the rapid expansion of business operations abroad among the largest firms reflects that the general climate for high value-added activities in the Nordic countries is deteriorating. All the Nordic countries have envisaged an economic development that at least matches that of most other industrialized countries, and the utilization of domestic resources has generally been high. Thus, the expansion of the largest firms abroad has not led to any specific unemployment on the Nordic scene or to a specific poor economic performance among the Nordic countries. The Nordic countries rather seem to perform relatively well by international comparison.

The development which we have observed among the largest firms is to a large extent quite consistent with what we would predict when considering the structural changes that we should expect in the economies of rich countries, like those on the Nordic scene. Globalization, i.e. the integration of the world economy, implies that labour intensive manufacturing, or less technologically advanced manufacturing, will be reallocated from rich to emerging industrial economies. As regards the Nordic countries, industry data clearly indicate that this is a process that has been going on over the last 30 years.

At the corporate level, this ought to be reflected among the large Nordic firms as an absolute reduction of less technologically advanced manufacturing in the home country, while the large firms still may be engaged in such activities abroad and even expand globally. This cannot be properly documented or tested with our data on the largest firms, as we do not know all details about their industrial activities. However, the Danish shoemaker, ECCO, might serve as an example of the restructuring going on among the largest Nordic firms. ECCO was established in 1963, and until 1983 all activities were conducted in Denmark. Since then ECCO has established subsidiaries in Portugal, Slovakia, Thailand, Indonesia and China. Today only five per cent of the workforce of more than 20,000 employees is employed in Denmark. But the most value adding activities like research, design, branding management etc. are still located in Denmark – so that more than 50 percent of the value added in the whole value chain is still taking place in Denmark (Nielsen, Pedersen and Pyndt, 2008).

When pursuing the issue of whether it is the low or the high value added activities that are relocated internationally we are only able to classify each firm according to the main industry in which they are engaged. This, of course, will conceal all the different varieties of industrial activities that may go on within each large firm. It does, however, provide us with an opportunity to apply OECD's definitions of "low tech", "medium-low tech", "medium-high tech" and "high tech" manufacturing. In Table 8.3, firms whose main industry is classified as "low tech" and "medium-low tech", are grouped together and referred to as technologically less advanced manufacturers.

Table 8.3: Technologically less advanced firms among the 30 largest manufacturing firms. Global employment and share of employment in home country units, 1996 and 2006

	Sweden		Denmark		Finland		Norway	
	1996	2006	1996	2006	1996	2006	1996	2006
Global employment (1000 persons)	183	266	119	168	196	232	92	100
Share of employment in home country units, %	48,6	18,2	63,3	30,1	59,6	35,0	56,9	41,4

It is quite clear that the industrial activities of technologically less advanced firms measured by employment increasingly take place outside the home country, and in all the Nordic countries these firms have reduced the employment in their home country units while they have continued to grow globally. Thus, the share of domestic employment is reduced by 15-35 percentage points within the ten-year period.

On the other hand, even though we argue that the industrial base of the Nordic countries should restructure to become more knowledge intensive, for the technologically advanced firms among the 30 largest we cannot assume that home country activities necessarily should play an increasing role in their global operations. Large technologically advanced firms may, for instance, expand more rapidly abroad than in the home country without signaling specific worries with reference to the outlook for the home country economy. Neither is it necessarily the case that technologically advanced firms should increasingly dominate industrial activities within the group of the 30 largest firms. The nature of scale economies may be such that it is not the largest firms that primarily execute technologically advanced operations in the economy. It may, however, be a matter of concern if the largest technologically advanced firms reduce their global activities while their units located in the home country also contribute with a declining share of their global activities. This may suggest a shift in the knowledge base within these firms from activities based in their home country to their foreign units, which, in case, is likely to reflect weaknesses in the economy of the home country. Thus, it is of interest to document how the activities of the technologically advanced firms, defined as those whose main industry is classified as “high tech” or “medium-high tech” by the OECD, have developed since the mid-1990s.

Table 8.4: Technologically advanced firms among the 30 largest manufacturing firms.
Global employment and share of employment in home country units, 1996 and 2006

	Sweden		Denmark		Finland		Norway	
	1996	2006	1996	2006	1996	2006	1996	2006
Global employment (1000 persons)	488	401	75	108	117	189	139	92
Share of employment in home country units, %	37,6	31,5	52,7	41,0	48,8	26,5	33,7	37,4
Share of employment in the group of the 30 largest, %	72,7	60,1	38,6	39,1	37,4	44,9	60,1	48,0

The global activities of the technologically advanced firms among the 30 largest manufacturing firms, measured in terms of employment, are smaller in 2006 than in 1996 for the largest Swedish and Norwegian firms, while in Denmark and Finland the global activities of technologically advanced large firms have increased over the same period. It is also the case that firms classified as technologically advanced make up for a smaller share of the global industrial activities conducted by the 30 largest manufacturing firms in Sweden and Norway in 2006 compared to 1996, while the share has remained almost the same in Denmark and has increased in Finland.

In Norway, the share of employment in home country units of the largest, technologically advanced firms has increased slightly, while global employment is reduced. The technologically advanced large firms of Denmark and Finland have increased their global employment, while the share of employment in domestic units of these firms is reduced. For the largest Swedish firms the employment reduction within these more advanced firms has been considerably more sizeable in relative terms in domestic units than in units in other parts of the world. Although we have seen that the technologically less advanced firms (Table 8.3) have reduced their domestic employment even more than the technologically advanced firms (Table 8.4), the results may suggest that the largest technologically advanced firms still find it more attractive to engage in technologically advanced operations abroad. More detailed information is needed, however, in order to be more conclusive on this matter and on what it means for the economic prospects of the home country.

The largest Nordic firms and the innovative environment

The Nordic scene

In our studies of the largest firms in the Nordic countries up to the mid 1990s, we emphasized that these domestic firms in general had become multinationals, that they predominantly were to be regarded as key actors in their respective national economies, and that business operations had become much more internationalized than strategic functions like R&D and headquarter operations. The pattern of a stronger internationalization of operative business functions compared to strategic functions has later been confirmed by Benito et al. (2002), whereas the DOMUS project (Herstad and Jonsdóttir, 2006) emphasized the key role of domestic multinationals in their national innovations system, and that they in particular serve as global knowledge pipelines in this respect.

In this study we have updated the data for the growth pattern of the largest firms until 2006. This confirms the earlier picture in the sense that operative business functions are more internationalized than strategic functions, and that the largest firms have a stronger global orientation compared to other national firms. At the same time, however, we find that also the strategic functions of the largest firms, such as R&D, increasingly take place in foreign units, and that their share of production and R&D in the home country is declining. Thus, their role as key actors in the innovation systems on the Nordic scene is likely to have been weakened.

Integration on the Nordic-Baltic scene

The 30 largest firms of all the Nordic countries are quite frequently located in other Nordic countries as well. They seldom, however, conduct activities in another Nordic country that are of a magnitude that qualifies the subsidiary to be one of the 30 largest firms in that country too. This differs with regard to the emerging economies of the Baltic countries, or at least with regard to Estonia. As the country chapter on Estonia shows, many of the largest companies in Estonia are subsidiaries of firms whose home base is one of the Nordic countries. In 2006, this was the case with 20 of the 30 largest manufacturing firms in Estonia, and with 13 of the 30 largest private sector firms. Several of these Nordic parent firms were among the 30 largest firms in their home country, while others were smaller firms with Estonian outlets. This nevertheless reflects an integration of business activities on the Nordic-Baltic scene.

In service industries, these foreign investments in Estonia are generally market driven. Within manufacturing, it is more a matter of outsourcing and subcontracting in order to reduce costs. While the market-driven investments in services may enhance some R&D, as is shown by the Estonian country chapter to be taking place in financial intermediation, the factor-driven investments in manufacturing are less attached to other business in the Estonian economy. Quite a number of the largest foreign-owned manufacturing companies with a pure subcontracting profile have more or less no contact with local Estonian companies and local education and R&D. Thus, direct positive spillovers to the Estonian economy are rather limited. This may challenge the foundation for current economic and innovation policies, assuming that an increase in inward investments will enhance local industrial competence and the local innovative environment through the inflow of know-how, closer business relations to local industry, and stronger competitive pressure to innovate. To the extent that foreign-owned firms mostly operate as enclaves in the local business community, such positive industrial spillovers are not likely to take place.

Policy implications

The crucial task for politicians is to ensure that the national economy provides an attractive environment for internationally oriented firms and investors to locate their activities and investments. Thus, it should not be of any concern that the largest Nordic firms no longer play the same key role on the Nordic scene, or in the individual Nordic countries, as they used to do 10-20 years ago. Nor should it be a matter of concern that the largest firms increasingly expand their business abroad. This even holds for the internationalization of strategic functions as long as the home country proves attractive for private investors to engage in and improve local capability of value generation and the enhancement of industrial knowledge.

In this respect, the weakened role of the largest firms in the national economy may be considered an advantage, as it should reduce the macro-economic vulnerability which has been linked to their dominant position. However, the fact that they have chosen to increasingly operate abroad may, without further analysis, also be interpreted as a sign that the conditions for value generation in the home country are deteriorating in a way that may be disastrous for the home country in a longer time perspective. Regardless of which one of these

interpretations that might be correct, the adequate policy response is to try to improve conditions for value generation and business in general. Any attempt to secure the position of previous champions will prove inefficient, as it will prevent necessary dynamics of change.

To ensure an attractive industrial base for investments, a sound economic policy is, of course, self evident. This includes predictability in taxes and regulations, a modern infrastructure, well-functioning factor markets, efficient welfare systems, rule of law and lack of corruption. In addition, focus ought to be on innovative capabilities (Heum, 2007), which in a more knowledge-based economy should concern 1) how to improve capabilities to generate and absorb knowledge, whether it is science-based or based on experience, 2) how to improve capabilities to disseminate knowledge across the society, and 3) how to improve the capabilities of applying new knowledge and new combinations of knowledge for productive purposes, i.e. to succeed with innovation. This further requires a social climate which encourages entrepreneurship and approves failure as well as technological and structural change.

This means that an important aspect of industrial policy is to promote the absorption of knowledge and knowledge spillovers which are mainly generated abroad. This requires investment in the human capital and skills necessary to apply state of the art technology and insights, through the educational system and through the recruitment of experts from abroad. It further implies investment in activities with potentially high externalities, such as policy-support schemes for industrial R&D, where basic research rather than development is prioritized, i.e. the R in R&D and not the D. This holds regardless of whether the research takes place in firms or in universities and research institutions.

From analyzing the largest firms we know that they increasingly operate their business on a global scale. This means that national schemes to enhance local value generation, whether directed towards specific functions or industrial clusters, may leak to and benefit foreign activities and only to a minor extent benefit the activities for which they were intended. As governments ought to engage in economic and industrial policy to maximize national welfare; Ulltveit-Moe (2008) suggests that the design of industrial policy schemes ought to take into account the local anchoring of knowledge spillovers and vertical linkages between firms.

Besides this aspect of national welfare generation, which is a direct policy implication of the growth patterns we see among the largest firms, the most adequate policy response to globalization of markets and firms is quite generally to enforce policies and schemes which are likely to strengthen the industrial base for value generation in the national economy. The purpose is to remain, or become an even more attractive environment for globally oriented firms and actors to invest and operate in.

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